975/1

Vol. 975 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 3, 1978

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

October 3, 1978 Volume 975 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $300.00 per annum for first-class mailing, also available as fourth-class mail at $200.0u; foreign first-class mailing rates will be furnished upon request; single copies each, $4.00 domestic, $5.00 foreign.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

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PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

Reinstatement of Patent Attorneys and Agents Registered to Practice Before the U.S. Patent and Trademark Office

Any person whose name has been removed from the Register of Attorneys or the Register of Agents pursuant to 37 CFR 1.347 may request reinstatement on the appropriate register. However, where the long lapse of time since removal or other circumstances indicate that the person may no longer be qualified for registration, the Committee on Enrollment may require the person to again show that he or she satisfies the requirements of 37 CFR 1.341(c) and that registration would be appropriate before reinstatement is granted.

LUTRELLE F. PARKER,
Aug. 21, 1978. *Chairman, Committee on Enrollment.*

Reprint of the September 12, 1978 List of Patentees

The List of Patentees published in the September 12, 1978 OFFICIAL GAZETTE erroneously listed Application Serial Numbers preceded by the letter "B" instead of Patent Numbers. The corrected List of Patentees to whom patents were issued on the 12th day of September 1978 is reprinted in its entirety in the October 3, 1978 OFFICIAL GAZETTE (Vol. 975, No. 1), and is the last Index in this publication.

BRADFORD R. HUTHER,
Sept. 20, 1978. *Deputy Assistant Commissioner for Administration.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,798,213, W. G. Rowell, CHECKING TECHNIQUE AND SYSTEM; **2,798,214,** same, **filed** Mar. 25, 1977, D.C. Mass. (Boston), Doc. 77–1144, *Scully Signal Company* v. *Electronics Corporation of America.* The judgment of the district court is affirmed. **Same, filed** Mar. 18, 1977, D.C. Mass. (Boston), Doc. 77–1133, *Scully Signal Company* v. *Electronics Corporation of America.* The judgment of the district court is affirmed.

2,798,214. (See 2,798,213.)

3,009,235, G. De Mestral, SEPARABLE FASTENING DEVICE, **filed** Feb. 28, 1977, D.C., W.D. Tenn. (Memphis), Doc. C–77–2133, *Velcro S.A. and Actief N.V.* v. *Comfort Care Products, Inc.* Inasmuch as the record indicates that neither plaintiff nor defendant held patent title at the inception of the suit and have failed to establish title in compliance with the court earlier, order, defendant's motion to dismiss is granted. This cause is hereby dismissed, Mar. 14, 1978.

3,087,005, Sabatino and Lowe, METHOD OF MAKING STORAGE BATTERY ELEMENTS; **3,229,339,** same; **3,238,579,** same, METHOD OF MAKING BATTERY ELEMENTS; **3,313,658,** Sabatino and Orlando, STORAGE BATTERY CONSTRUCTION; **3,364,076,** Buttke and Orlando, ALIGNING ARRANGEMENT FOR MULTICELL BATTERIES; **3,388,007,** R. M. Fiandt, A THIN WALL POLYPROPYLENE BATTERY CASE; **3,897,269,** same, STORAGE BATTERY CONSTRUCTION AND METHOD OF MAKING SAME, **filed** July 1, 1977, D.C. Del. (Wilmington), Doc. 77–246, *ESB, Inc.* v. *Globe-Union Inc.*

3,150,840, Briskin, Moore, Pastor, and Rom, TAPE CARTRIDGE, **filed** Feb. 27, 1978, D.C., S.D.N.Y. Doc. 78–C–881, *Minnesota Mining & Manufacturing Co.* v. *Microfilm Products, Inc.*

3,214,936, L. J. Di Peri, DRY-AIR EVAPORATIVE COOLER; **3,877,244,** same, MODULAR DRY-AIR EVAPORATIVE COOLER, **filed** Jan. 30, 1978, D.C., N.D. Calif. (San Francisco), Doc. C–78–219 WAI, *Leonard J. Di Peri and Di Peri Manufacturing Corp.* v. *American Environmental Systems, Inc. et al.*

3,224,201, J. L. Brunton, SHORING APPARATUS, **filed** Sept. 30, 1974, D.C. Ariz. (Phoenix) Doc. C74–644–PhX, *Speed Shore Corporation* v. *Woudenberg Enterprises, Inc., doing business as Starlite Barricade & Sign.* Final judgment and writ of permanent injunction granted plaintiff, Feb. 22, 1978.

3,229,339. (See 3,087,005.)

3,238,579. (See 3,087,005.)

3,276,784, H. M. Anderson, LAMINATED SKI HAVING A FOAM FILLED HONEYCOMB CORE, **filed** Feb. 9, 1976, D.C., N.D. Ohio (Toledo), Doc. C76–36, *Henry M. Anderson, Jr.* v. *The George Haffelder Co., Inc.* Stipulated settlement endorsed by Judge Young, defendants are permanently enjoining against infringing any claim of said patent during unexpired term, Feb. 24, 1978.

3,285,182, H. E. Pinkerton, DIAPHRAGM METERING PUMP, **filed** Feb. 23, 1978, D.C., E.D.N.Y. (Brooklyn), Doc. 78–C–337, *General Signal Corp.* v. *Harry E. Pinkerton and Fluid Metering, Inc.*

3,313,658. (See 3,087,005.)

3,364,076. (See 3,087,005.)

3,388,007. (See 3,087,005.)

3,396,342, A. E. Feinberg, POWER SUPPLY CIRCUIT FOR CONTINUOUS WAVE MAGNETRON OPERATED BY PULSED DIRECT CURRENT, **filed** Oct. 12, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2555, *Advance Transformer Co.* v. *Sears Roebuck and Co.* The court finds, and it is ordered, adjudged and decreed that this action is and shall be dismissed without prejudice, Jan. 11, 1977.

3,442,623, P. E. Aegidius, METHOD OF DETERMINING THE FAT CONTENT OF MILK AND RELATED PRODUCTS, **filed** Feb. 16, 1978, D.C., S.D.N.Y. Doc. 78–C–713, *A/S N. Foss Electric* v. *On-Line Instrumentation, Inc.*

3,471,011, Iannicelli, Millman, and Stone, PROCESS FOR IMPROVING THE BRIGHTNESS OF CLAYS, **filed** Jan. 27, 1977, D.C.N.J. (Trenton), Doc. 77–173, *Engelhard Minerals and Chemicals Corp.* v. *J. M. Huber Corp.* Voluntarily dismissed by plaintiff, Feb. 14, 1978.

3,630,505, B. R. MacKay, SILVER RECOVERY; **3,692,291,** same; **3,744,995,** same, **filed** Mar. 28, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–1128–WMB, *Byron R. MacKay et al.* v. *West Coast Silver Refining Corp.* Filed Stipulated and consent decree and order thereon that plaintiffs' patents are valid; that defendant, etc. are permanently enjoined from further infringement of plaintiffs patent as consented to herein, Jan. 31, 1978.

3,692,291. (See 3,630,505.)

3,744,995. (See 3,630,505.)

3,826,057, J. W. Franklin, TRUSS SYSTEM; **3,942,618,** same, ROLLERWAY FOR HANDLING MOLDING APPARATUS; **4,005,629,** same, TRUSS BOLT DRIFT PIN, **filed** Oct. 31, 1977, D.C. N. Mex. (Albuquerque), Doc. C–77–685M, *Form-Eze Systems, Inc.* v. *Ecco International, Ltd.* That the defendants are permanently enjoined from infringing Letters Patent including making, using or selling any device that embodies the invention claimed in such Letters Patent, Feb. 28, 1978.

3,848,764, G. Saig, ELECTRICAL BOX STRUCTURE FOR SECUREMENT TO WALL PANELING WITHOUT SEPARATE FASTENERS, **filed** Feb. 1, 1978, D.C., N.D. Ill. (Chicago) Doc. 78c362, *Unarco Industries, Inc.* v. *Ware Fuse Corporation.*

3,877,244. (See 3,214,936.)

3,897,269. (See 3,087,005.)

3,942,618. (See 3,826,057.)

3,954,265. D. L. Taylor, BALANCED GOLF CLUB; **D. 240,715,** R. R. Schwartz, TISSUE BOX COVER OR SIMILAR ARTICLE, **filed** Aug. 8, 1977, D.C., S.D. Calif. (San Diego), Doc. 77-0518-S, *Taylorcraft v. Glf. Inc.* The infringement of plaintiff's United States Letters Patent and United States trademarks by defendant will continue to the irreparable harm of plaintiff unless it is enjoined by this court, Sept. 26, 1977.

4,005,629. (See 3,826,057.)

4,034,210, Hill, Dahlstrom, and Fisher, CREDIT CARD CARRIERS AND METHOD OF MANUFACTURE, **filed** Feb. 1, 1978, D.C. Minn. (Minneapolis), Doc. 4-78-C 42, *Data Card Corporation v. Dynetics Engineering Corporation.* **Same, filed** Feb. 1, 1978, D.C., N.D. Ill. (Chicago) Doc. 78c343, *Dynetic Engineering Corporation v. Continental Illinois National Bank and Trust Company.*

4,036,265, R. W. Hayes, FIREPLACE STOVE, **filed** Mar. 10, 1978, D.C. Conn. (Hartford), Doc. H78-126, *C & D Distributors, Inc. v. Hayes-Te Equipment Corporation.*

D. 176,907, W. C. Carmichael, SPECTACLE FRAME OR THE LIKE, **filed** Sept. 17, 1976, D.C.N.J. (Newark), Doc. C-76-1822, *Energy Unlimited, Inc. v. George Merkl.* Order dismissing action without costs. Dec. 21, 1977.

D. 197,341, J. E. Cornish, INFANT'S RIDING TOY, **filed** Feb. 17, 1978, D.C.N.J. (Trenton), Doc. C-78-316, *Judson E. Cornish v. Frank Caplan.*

D. 215,979, H. P. Post, DISPLAY CABINET FOR MERCHANDISE, **filed** Dec. 5, 1977, D.C. Conn. (Hartford), Doc. H77-623, *M. G. Design Associates, Inc. v. Display Workshop Inc. and Harold P. Post.* Notice of dismissal filed by plaintiff on Jan. 27, 1978.

D. 224,898, Wallach and Franzino, CRYOSURGICAL INSTRUMENT, **filed** July 28, 1977, D.C. Conn. (Bridgeport), Doc. B-77-227, *Cryomedics, Inc. v. Medical Specialties-Northeast, Inc.*

D. 245,715. (See 3,954,265.)

D. 246,874, L. B. Schwartz, HANDBAG, **filed** Mar. 15, 1978, D.C., S.D.N.Y. Doc. 78-C-1145CHT, *Acricite Co., Inc. v. Jaclyn, Inc.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,244,681, Re. S.N. 933,384, Filed Aug. 11, 1978, Cl. 526/64, PRESSURE RELIEF SYSTEM FOR PRESSURE VESSELS, Raymond G. Rohlfing, et al., Owner of Record: *Phillips Petroleum Company, Bartlesville, Okla.,* Attorney or Agent: Donald J. Quigg, et al., Ex. Gp.: 144

3,405,109, Re. S.N. 933,408, Filed Aug. 11, 1978, Cl. 260/64, POLYMERIZATION PROCESS, Raymond G. Rohlfing, Owner of Record: *Phillips Petroleum Company, Bartlesville, Okla.,* Attorney or Agent: Donald J. Quigg, et al., Ex. Gp.: 144

3,814,730, Re. S.N. 928,844, Filed Jul. 27, 1978, Cl. 260/46.5 UA, PLATINUM COMPLEXES OF UNSATURATED SILOXANES AND PLATINUM CONTAINING ORGANOPOLYSILOXANES, Bruce D. Karstedt, Owner of Record: *General Electric Company, Waterford, N.Y.,* Attorney or Agent: Donald J. Vass, et al., Ex. Gp.: 143

3,888,312, Re. S.N. 930,843, Filed Aug. 3, 1978, Cl. 166/308, METHOD AND COMPOSITIONS FOR FRACTURING WELL FORMATIONS, Robert L. Tiner, et al., Owner of Record: *Halliburton Company, Duncan, Okla.,* Attorney or Agent: John H. Tregoning, et al., Ex. Gp.: 354

3,973,912, Re. S.N. 933,209, Filed Aug. 10, 1978, Cl. 23/230 B, MICRO-GASOMETRIC METHOD AND APPARATUS, John E. Trafton, et al., Owner of Record: *American Hospital Supply Corporation, Evanston, Ill.,* Attorney or Agent: Timothy L. Tilton, et al., Ex. Gp.: 171

3,981,671, Re. S.N. 929,685, Filed Jul. 31, 1978, Cl. 425/453, LIQUID REACTION MOLDING PRESS, Bobbie Lee Edwards, Owner of Record: *Cincinnati Milacron Inc., Cincinnati, Ohio,* Attorney or Agent: Daniel P. Worth, et al., Ex. Gp.: 322

3,993,867, Re. S.N. 929,761, Filed Jul. 28, 1978, Cl. 178/58, DIGITAL SINGLE SIGNAL LINE FULL DUPLEX METHOD AND APPARATUS, William R. Blood, Jr., Owner of Record: *Motorola, Inc., Chicago, Ill.,* Attorney or Agent: Marvin A. Glazer, et al., Ex. Gp.: 232

3,996,397, Re. S.N. 925,962, Filed Jul. 18, 1978, Cl. 427/145, THERMOGRAPHIC RECORDING PROCESS, Urbain Leopold Laridon, Owner of Record: *AGFA-Gevaert, Mortsel, Belgium,* Attorney or Agent: William J. Daniel, Ex. Gp.: 162

4,035,510, Re. S.N. 931,093, Filed Aug. 4, 1978, Cl. 424/325, TREATMENT OF ACNE UTILIZING N-METHYLDIETHANOLAMINE, Eugene J. Van Scott, et al., Owner of Record: *Inventors,* Attorney or Agent: Robert E. Le Blanc, et al., Ex. Gp.: 125

4,054,793, Re. S.N. 925,603, Filed Jul. 17, 1978, Cl. 362/127, LIGHTING SYSTEM, Sylvan R. Shemitz, Owner of Record: *Sylvan R. Shemitz and Associates, Inc., West Haven, Conn.,* Attorney or Agent: Anthony P. Delio, et al., Ex. Gp.: 221

4,062,188, Re. S.N. 905,117, Filed May 11, 1978, Cl. 60/599, TURBOCHARGER SYSTEM FOR AN INTERNAL COMBUSTION ENGINE, John Frederick Cutler, Owner of Record: *Wallace Murray Corporation, New York, N.Y.,* Attorney or Agent: Thomas J. Greer, Jr., et al., Ex. Gp.: 343

Patent Cooperation Treaty (PCT): Information for Prospective Applicants

This notice includes information on the following topics of interest to prospective PCT applicants:

I. Fees for the processing of International applications
II. PCT Member States which may be designated in International applications
III. PCT International application transmittal letter for use by applicants
IV. Documents concerning the PCT available from the World Intellectual Property Organization (WIPO)

TOPIC I: FEES FOR THE PROCESSING OF INTERNATIONAL APPLICATIONS

(The amounts of the fees have not been changed. The listing appearing in the May 16, 1978 OFFICIAL GAZETTE is reprinted here for the convenience of the public.)

The Patent and Trademark Office when acting as a Receiving Office and International Searching Authority will charge certain fees for the processing of International applications. The name of the fee, the amount and the date when the fee is due are listed below. Applicants are cautioned that the fee amounts are subject to change. Any changes in the amount of the fees, and the effective dates of the changed amounts will be listed in the OFFICIAL GAZETTE.

As failure to pay in full upon filing those fees due upon filing will result in the withdrawal of the International application, applicants are strongly urged to consult the OFFICIAL GAZETTE for specific fee amounts before filing.

PCT PROCESSING FEES (AS OF 01 JUNE 1978)

Fee	*Amount*	*Time Due*
Transmittal Fee	$35.00	Upon filing.
Search Fee	300.00	Upon filing.
Supplemental Search Fee	200.00 per invention	Within time limit set in notice to applicant.
International Fee		
(1) Basic Fee		
First 30 sheets of application	$165.00	Upon filing.
Each sheet over 30	3.00	Upon filing.
(2) Designation Fee		
Each State for which a patent is sought, or, each group of States for which the same Regional patent is sought.	40.00	12 months from priority date or, if no priority date, 12 months from the International application filing date.

TOPIC II: PCT MEMBER STATES WHICH MAY BE DESIGNATED IN INTERNATIONAL APPLICATIONS

Twenty (20) States have ratified or acceded to the Patent Cooperation Treaty. Their names and the date from which these states may be designated in International applications will be printed in the OFFICIAL GAZETTE.

It should be noted that Japan may be designated in international applications filed on and after 01 October 1978, and that Denmark may be designated in international applications filed after 01 December 1978.

The footnotes to the listing of States indicate those States for which regional patent protection is available and any restrictions on the availability of patent protection using PCT.

Applicants are urged to consult also the "PCT Applicant's Guide" and the "Gazette of International Patent Applications" published by the World Intellectual Property Organization (WIPO) as well as the national laws of the Member States for detailed information regarding the availability of protection other than patents in each Member State.

State	*Ratification or Accession*	*Date of Ratification or Accession*	*Date From Which State May Be Designated*
(1) Central African Empire*	Accession	15 September 1971	01 June 1978
(2) Senegal*	Ratification	08 March 1972	01 June 1978
(3) Madagascar	Ratification	27 March 1972	01 June 1978
(4) Malawi	Accession	16 May 1972	01 June 1978
(5) Cameroon*	Accession	15 March 1973	01 June 1978
(6) Chad*	Accession	12 February 1974	01 June 1978
(7) Togo*	Ratification	28 January 1975	01 June 1978
(8) Gabon*	Accession	06 March 1975	01 June 1978
(9) United States of America	Ratification	26 November 1975	01 June 1978
(10) Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11) Congo*	Accession	08 August 1977	01 June 1978
(12) Switzerland**	Ratification	14 September 1977	01 June 1978
(13) United Kingdom**	Ratification	24 October 1977	01 June 1978
(14) France**	Ratification	25 November 1977	01 June 1978
(15) Soviet Union	Ratification	29 December 1977	01 June 1978
(16) Brazil	Ratification	09 January 1978	01 June 1978
(17) Luxembourg**	Ratification	31 January 1978	01 June 1978
(18) Sweden**	Ratification	17 February 1978	01 June 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark	Ratification	01 September 1978	01 December 1978

* Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI member states. A designation of any state is an indication that all OAPI states have been designated. Note: only one designation fee is due regardless of the number of OAPI member states designated.

** Members of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member States are available through PCT, *except for France*, for which only European patents are available if PCT is used. If regional protection is desired for one or more States, the indication "regional patent" must follow the designation of the State or States. Note: only one designation fee is due if the regional patent protection is sought for several States.

TOPIC III: PCT INTERNATIONAL APPLICATION TRANSMITTAL LETTER

A PCT International application transmittal letter, form PTO–1382, is now available free of charge for applicants to use when filing PCT International applications with the United States Receiving Office. The form, a copy of which is reproduced below, is intended to simplify the filing of PCT International applications by providing a one-page letter which covers the most common requests and concerns of applicants. Specifically covered are:

1) Requests under 37 CFR 1.451 for preparation and transmittal to the International Bureau of certified copies of U.S. national applications, the priority of which is claimed in International applications;
2) Requests for transmittal of the Record Copy by the applicant to the International Bureau under 37 CFR 1.461;
3) Authorizations for any required Supplemental search fees to be charged to a deposit account subject to oral confirmation of the authorization.
4) Statements of preference and authorization for any refund or reimbursement of the Search fee or Supplemental search fee to be credited to a deposit account or to be refunded by U.S. Treasury Department check;
5) Indications of information concerning differences in disclosure, if any, between the international application and related applications to assist in determining any foreign transmittal licensing requirements as well as for other purposes; and
6) Requests for foreign transmittal license.

Copies of the PCT International application transmittal letter, form PTO–1382, may be ordered by mail addressed to the Commissioner of Patents and Trademarks, Box PCT, Washington, D.C., 20231, or by telephone at (703) 557–2003. Copies are also available in Crystal Plaza Building 2, Room 4–C–08, and in the lobby of Crystal Plaza Building 3.

TOPIC IV: DOCUMENTS CONCERNING THE PCT AVAILABLE FROM THE WORLD INTELLECTUAL PROPERTY ORGANIZATION (WIPO)

Prices in U.S. dollars per copy, including mailing charges valid until at least 31 October 1978.

	By surface mail	By airmail
PCT Applicant's Guide	First copy free of charge. For each additional copy: $4.00	$8.00
PCT (Treaty and Regulations)	4.00	5.00
PCT Gazette:		
Subscription for 1978	50.00	60.00
Single issues in 1978	6.00	8.00
Items of Non-Patent Literature under PCT Rule 34.1(b)(iii) (included in the PCT Gazette No. 2) (previously document PCT/INT/1)	6.00	8.00
Administrative Instructions under the Patent Cooperation Treaty (included in the PCT Gazette No. 1)	6.00	8.00
As a separate A4 brochure	3.00	4.00
With its Annexes (all PCT Forms) (previously document PCT/INT/2)	23.00	28.00
Receiving Office Guidelines for the Processing of International Applications under the Patent Cooperation Treaty (document PCT/INT/4)	3.00	4.00
Guidelines for International Search to be Carried Out under the Patent Cooperation Treaty (document PCT/INT/5)	2.00	2.00
Guidelines for International Preliminary Examination to be Carried Out Under the Patent Cooperation Treaty (document PCT/INT/6)	3.00	4.00
Guidelines for Drawings under the Patent Cooperation Treaty (document PCT/INT/7)	First copy free of charge. For each additional copy: 0.50	1.00
Guidelines for the Preparation of Abstracts under the Patent Cooperation Treaty (document PCT/INT/8)	First copy free of charge. For each additional copy: 0.50	1.00
Guidelines for Publication under the Patent Cooperation Treaty (document PCT/INT/9)	4.00	5.00
Time Limits under the Patent Cooperation Treaty (document PCT/INT/10)	6.00	6.00
Records o fthe Washington Diplomatic Conference (1970)	63.00	76.00

Mode of Ordering and Paying

Orders should be addressed to:
WIPO—World Intellectual Property Organization

If by mail:
34, Chemin des Colombettes
1211 Geneva 20
Switzerland

If by telex:
22376 WIPO CH

If by telephone:
99 91 11 (ask for the PCT Division)

Payments may be effected by check or by transfer to our account at the Swiss Credit Bank, 1211 Geneva 11 (Switzerland).

RENE D. TEGTMEYER,
Sept. 12, 1978. *Assistant Commissioner for Patents.*

PCT INTERNATIONAL APPLICATION TRANSMITTAL LETTER	DATE:
REGARDING THE INTERNATIONAL APPLICATION OF	DOCKET OR REFERENCE NUMBER
ENTITLED	

To the United States Receiving Office (RO/US):

Accompanying this transmittal letter is the above-identified International application, including a completed request form (PCT/RO/101). Please process the application according to the provisions of the Patent Cooperation Treaty.

The following requests are made of the RO/US:

1. ☐ CERTIFIED COPY PREPARATION—Please prepare a certified copy of the priority document for the above-identified International application and transmit the certified copy to the International Bureau according to the provisions of 37 CFR 1.451.

IDENTIFICATION OF PRIORITY DOCUMENT	U.S. SERIAL NUMBER	U.S. FILING DATE	APPLICANT

To cover the cost of copy preparation and certification,

☐ a (check) (money order) in the amount of $ _____ is attached to this transmittal letter.

☐ the RO/US is hereby authorized to charge the following deposit account no.: _____.

2. ☐ ALTERNATE TRANSMITTAL OF RECORD COPY—As the accompanying International application is being filed within 11 months of the claimed priority date, according to the provisions of 37 CFR 1.461,

☐ hold the Record Copy available for pickup by 10 days before the expiration of 13 months from the claimed priority date in room 2-4C08, Crystal Plaza, Arlington, VA.

☐ mail the Record Copy to me by 15 days before the expiration of 13 months from the priority date.

3. ☐ SUPPLEMENTAL SEARCH FEES—Please charge any Supplemental Search fees that may be required by the United States International Searching Authority (ISA/US) to deposit account no.: _____.

I understand that this authorisation is subject to my oral confirmation thereof in each instance and that it in no way limits my right to submit a protest against payment of the Supplemental Search fees, but is merely an administrative aid to assure that the ISA/US may timely complete the Search Report.

4. ☐ **REFUND OF SEARCH FEES/SUPPLEMENTAL SEARCH FEES**—If the ISA/US determines that a refund or reimbursement of the Search fee and/or any Supplemental Search fees is warranted due to the benefit of a prior search, or due to a decision that applicant's protest is justified, such refund is

☐ to be in the form of a U.S. Treasury check.

☐ authorized to be credited to the following deposit account no.: _____ .

5. ☐ **DISCLOSURE INFORMATION**—In order to assist in screening the accompanying International application for purposes of determining whether a license for foreign transmittal should and could be granted and for other purposes, the following information is supplied:

A. ☐ There is no prior filed application relating to this invention.

B. ☐ There is a prior application, serial number _____ filed on _____ which contains subject matter that is

1. ☐ substantially identical to that of the accompanying International application.

2. ☐ less than that of the accompanying International application. The additional subject matter of the International application appears on page(s) and line(s) _____ .

3. ☐ more than that of the accompanying International application.

C. ☐ Disclosure information cannot be covered by the language of Points 5A or 5B above due to the involvement of several prior applications or for other reasons. A separate sheet on which the disclosure information is explained is attached to this transmittal letter.

6. ☐ **REQUEST FOR FOREIGN TRANSMITTAL LICENSE**—According to the provisions of 35 U.S.C. 184 and 37 CFR 5.11, a license to transmit the accompanying International application to foreign agencies or international authorities is hereby requested.

SIGNER IS THE:	NAME OF SIGNER (typed)
☐ APPLICANT	
☐ COMMON REPRESENTATIVE	SIGNATURE
☐ (ATTORNEY) (AGENT) REG. NO. _____	

PTO-1382 (6/78) U.S. DEPT. of COMM.-Pat. & TM Off.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 3, 1978

Re.29,410	4,065,298	4,080,455	4,085,142
Re.29,603	4,065,413	4,081,250	4,085,153
3,644,274	4,065,701	4,081,490	4,085,300
3,644,384	4,066,483	4,081,608	4,085,350
3,723,597	4,067,969	4,081,652	4,085,730
3,857,712	4,069,063	4,081,768	4,085,862
3,858,176	4,069,939	4,081,806	4,085,909
3,880,817	4,070,294	4,081,879	4,086,151
3,887,400	4,071,145	4,081,882	4,086,186
3,902,047	4,071,627	4,082,019	4,086,262
3,930,994	4,071,725	4,082,129	4,086,302
3,951,250	4,071,736	4,082,178	4,086,531
3,954,469	4,072,541	4,082,358	4,086,559
3,962,549	4,072,542	4,082,412	4,086,613
4,004,873	4,072,746	4,082,692	4,086,772
4,007,451	4,072,750	4,082,782	4,086,941
4,010,033	4,073,148	4,082,839	4,087,036
4,029,433	4,073,307	4,082,841	4,087,380
4,030,015	4,073,662	4,082,858	4,087,414
4,030,026	4,073,797	4,082,946	4,087,576
4,036,589	4,073,818	4,083,047	4,087,584
4,040,558	4,073,930	4,083,070	4,087,818
4,041,661	4,074,795	4,083,095	4,088,067
4,042,130	4,074,997	4,083,119	4,088,123
4,042,403	4,075,006	4,083,149	4,088,307
4,043,095	4,075,487	4,083,232	4,088,418
4,043,364	4,076,519	4,083,385	4,088,433
4,043,630	4,076,786	4,083,561	4,088,575
4,044,029	4,076,826	4,083,596	4,088,621
4,046,561	4,076,886	4,083,698	4,088,736
4,047,585	4,076,962	4,083,889	4,088,870
4,048,230	4,077,219	4,083,941	4,089,010
4,053,223	4,077,338	4,084,123	4,089,187
4,055,541	4,078,507	4,084,154	4,089,516
4,058,654	4,078,934	4,084,254	4,090,302
4,058,738	4,079,558	4,084,293	4,090,517
4,061,779	4,080,226	4,084,355	4,090,941
4,062,969	4,080,275	4,084,988	4,091,388
4,064,137	4,080,290	4,085,057	
4,065,078	4,080,364	4,085,058	

Disclaimers

3,217,546.—*Ray R. Cordell* and *Wayne F. Gustafson*, Minneapolis, Minn. AUTOMATIC GRAIN SAMPLING DEVICE. Patent dated Nov. 16, 1965. Disclaimer filed Mar. 24, 1977, by the assignee, *Gustafson, Inc.*

Hereby enters this disclaimer to claims 1–10 of said patent.

3,855,607.—*Henry Kressel*, Elizabeth, N.J., *Harry Francis Lockwood*, New York, N.Y., and *Frank Zygmunt Hawrylo*, Trenton, N.J. SEMICONDUCTOR INJECTION LASER WITH REDUCED DIVERGENCE OF EMITTED BEAM. Patent dated Dec. 17, 1974. Disclaimer filed July 28, 1978, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 6 and 8, of said patent.

3,949,826.—*Noah A. Shealy*, Niles, Mich. LUBRICATION SYSTEM FOR TRUNNION MOUNTING AXLE. Patent dated Apr. 13, 1976. Disclaimer filed Aug. 11, 1978, by the assignee, *Clark Equipment Company*.

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

4,019,372.—*Erwin C. Parkell*, Galena, Md., and *John A. Stamm*, Wilmington, Del. CHROMATOGRAPHIC DETECTOR SYSTEM. Patent dated Apr. 26, 1977. Disclaimer filed Aug. 21, 1978, by the assignee, *E. I. du Pont de Nemours and Company*.

Hereby enters this disclaimer to all claims of said patent.

4,052,590.—*Richard F. Anderl*, Chippewa Falls, and *Lawrence J. Tienor*, Eau Claire, Wis. ELECTRIC APPLIANCE WITH INTERMITTENTLY STAKED SHEATHED HEATING ELEMENT. Patent dated Oct. 4, 1977. Disclaimer filed Mar. 20, 1978, by the assignee, *National Presto Industries, Inc.*

Hereby enters this disclaimer to claim 4 of said patent.

4,058,949.—*Norman A. Bellem*, Kansas City, Mo. BUILDING ROOF INSULATION. Patent dated Nov. 22, 1977. Disclaimer filed Aug. 8, 1978, by the assignee, *Butler Manufacturing Company*.

Hereby enters this disclaimer to claims 1 and 5 through 15 of said patent.

Disclaimer and Dedication

3,663,880.—*Andrew Gabor*, Danville, Calif. APPARATUS FOR CONTROLLING THE RELATIVE POSITION BETWEEN TWO RELATIVELY MOVABLE MEMBERS. Patent dated May 16, 1972. Disclaimer and dedication filed June 21, 1978, by the assignee, *Xerox Corporation*.

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Patents Available for Licensing or Sale

3,734,241. DRIVE ON NO SLIP BLOCK. Chester A. Hale, 137 Bandy, Apt. 4, West Covina, Calif. 91790.

3,823,723. FALSE EYE BROUS. Marie O. Miller, 4165–A Parkway, Sacramento, Calif. 95823.

4,068,345. SHOWER CURTAIN ROD ASSEMBLY. Riloga-Werk Julius Schmidt, Germany, Correspondence to: Michael J. Stricker, 360 Lexington Ave., New York, N.Y. 10017.

4,076,201. ADJUSTABLE CHAIR SPINDLE ASSEMBLY. Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif. 90501.

4,105,246. MULTI-PURPOSE DASHBOARD UNIT. Gerald M. Trumbull, 522 Irish Settlement Road, Freeville, N.Y. 13068.

The General Electric Company is prepared to grant nonexclusive licenses under the following 24 patents upon reasonable terms to domestic manufacturers.

Application for license may be addressed to the Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky. 40225.

3,562,066. DIE STRUCTURE FOR HOT STAMPING MACHINE.

3,882,797. EXPANSION GRATE FOR INCINERATOR.

3,891,086. COMPOSTE PACKAGE.

3,941,339. MOUNTING ARRANGEMENT FOR FAN MOTOR.

3,952,369. HINGE STRUCTURE.

3,964,272. AIR CONDITIONING MOUNTING SYSTEM FOR A MOBILE HOME.

4,067,256. FASTENER ANCHOR FORMED IN THERMOPLASTIC SHEET.

4,067,628. FOAM-INSULATED SIDE-BY-SIDE REFRIGERATOR.

4,070,728. VERTICAL ADJUSTABLE DOOR HINGE ASSEMBLY.

4,072,374. SIDE FASTENER CLIP FOR A PLATE-LIKE MEMBER.

4,074,987. DEFROST SENSING SYSTEM FOR FREEZER COMPARTMENT.

4,075,864. AIR CONDITIONING FAN CONTROL.

4,081,997. CLOTHES DRYER AIR BLOW TEST DEVICE AND METHOD.

4,086,053. CLOTHES DRYER GAS HEATER.

4,087,987. DEFROST PRESSURE CONTROL SYSTEM.

Applications for license may be addressed to Patent Counsel, Turbine Patent Operation, General Electric Company, 1 River Road, Building 18A–5th Floor, Schenectady, N.Y. 12345.

3,991,333. WINDING SUPPORT STRUCTURE FOR SUPERCONDUCTING ROTOR.

3,991,587. METHOD OF SUPPLYING CRYOGENIC FLUID THROUGH A TRANSFER JOINT EMPLOYING A STEPPED BAYONET RELATIVE-MOTION GAP.

3,991,588. CRYOGENIC FLUID TRANSFER JOINT EMPLOYING A STEPPED BAYONET RELATIVE-MOTION GAP.

3,995,180. GENERATOR ROTOR OUTLETS FOR INCREASED VENTILATION.

4,018,059. CRYOGENIC FLUID TRANSFER JOINT EMPLOYING GASEOUS SEALS.

4,048,529. FLOW CONTROL DEVICE FOR SUPERCONDUCTIVE ROTOR REFRIGERANT.

4,054,809. STATOR CORE END MAGNETIC SHIELD FOR LARGE A.C. MACHINES.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Company, 1 River Road, Building #500, Room 218, Schenectady, N.Y. 12345.

3,967,353. GAS TURBINE BUCKET-ROAT SIDEWALL PIECE SEALS.

Applications for license may be addressed to Division Patent Counsel, Switchgear and Distribution Transformer Division, General Electric Company, 6901 Elmwood Avenue, Philadelphia, Pa. 19142.

3,814,885. METHOD OF DETECTING A LEAK IN A VACUUM INTERRUPTER LOCATED INSIDE A HOUSING CONTAINING PRESSURIZED GAS.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

Re. 29,662. RARE EARTH ACTIVATED LANTHANUM AND LUTETIUM OXY-CHALCOGENIDE PHOSPHORS.

4,093,152. DISC CADDY AND DISC PLAYER SYSTEM THEREFOR.

4,093,959. CHROMINANCE SIGNAL TRANSCODING APPARATUS.

4,094,582. LIQUID CRYSTAL MATRIX DISPLAY DEVICE WITH TRANSISTORS.

4,094,584. FORMAT FOR COLOR DIFFRACTIVE SUBTRACTIVE FILTERS.

4,095,011. ELECTROLUMINESCENT SEMICONDUCTOR DEVICE WITH PASSIVATION LAYER.

4,095,155. DIRECTION REVERSING DIRECT CURRENT MOTORS AND THEIR CONTROL.

4,095,164. VOLTAGE SUPPLY REGULATED IN PROPORTION TO SUM OF POSITIVE- AND NEGATIVE-TEMPERATURE-COEFFICIENT OFFSET VOLTAGES.

4,095,255. CONTROLLED OSCILLATOR WITH INCREASED IMMUNITY TO PARASITIC CAPACITANCE.

4,095,281. RANDOM ACCESS-ERASABLE READ ONLY MEMORY CELL.

4,095,876. LIQUID CRYSTAL DEVICE AND METHOD FOR PREPARING SAME.

4,096,387. ULTRAVIOLET RADIATION DETECTOR.

4,096,401. SENSE CIRCUIT FOR AN MNOS ARRAY USING A PAIR OF CMOS INVERTERS CROSS-COUPLED VIA CMOS GATES WHICH ARE RESPONSIVE TO THE INPUT SENSE SIGNALS.

4,096,415. SWITCHED VERTICAL DEFLECTION CIRCUIT.

4,096,416. VERTICAL DEFLECTION CIRCUIT WITH RETRACE SWITCH PROTECTION.

4,096,451. HIGH SIGNAL-TO-NOISE RATIO NEGATIVE RESISTANCE CRYSTAL OSCILLATOR.

4,096,454. AMPLITUDE AND DELAY EQUALIZATION OF SURFACE ACOUSTIC WAVE FILTERS IN AMPLITUDE MODULATION SYSTEM.

4,096,512. MONOLITHIC LIGHT DETECTOR.

4,096,513. COLOR VIDEO SIGNAL PROCESSING CIRCUITS.

4,096,516. ELECTRONIC SIGNAL PROCESSING APPARATUS.

4,096,517. VIDEO AMPLIFIER.

4,096,518. AVERAGE BEAM CURRENT LIMITER.

4,096,528. STANDARD/NONSTANDARD INTERNAL VERTICAL SYNC PRODUCING APPARATUS.

4,096,756. VARIABLE ACOUSTIC WAVE ENERGY TRANSFER-CHARACTERISTIC CONTROL DEVICE.

4,097,117. OPTICAL COUPLER HAVING IMPROVED EFFICIENCY.

4,097,118. OPTICAL WAVEGUIDE COUPLER EMPLOYING DEFORMED SHAPE FIBER-OPTIC CORE COUPLING PORTION.

4,097,314. METHOD OF MAKING A SAPPHIRE GATE TRANSISTOR.

4,097,618. METHOD OF TRANSFERRING A SURFACE RELIEF PATTERN FROM A POLY(1-METHYL-1-CYCLOPROPENE SULFONE) LAYER TO A NON-METALLIC INORGANIC LAYER.

4,097,636. METALLIZED DEVICE.

4,097,761. IMAGE TUBE CATHODE.

4,097,770. SCR TRIGGER CIRCUIT.

4,097,775. INFRARED SENSITIVE PHOTOCONDUCTIVE PICKUP TUBE.

4,097,810. PHASE LOCKED LOOP TUNING SYSTEM WITH A PRESET CHANNEL MEMORY.

4,097,889. COMBINATION GLASS/LOW TEMPERATURE DEPOSITED SI W N X H Y O Z PASSIVATING OVERCOAT WITH IMPROVED CRACK AND CORROSION RESISTANCE FOR A SEMICONDUCTOR DEVICE.

4,097,895. MULTILAYER OPTICAL RECORD.

4,097,896. SYNC SEPARATOR CIRCUIT.

4,097,899. VIDEO RECORD PLAYER SWITCHING SYSTEM.

4,097,920. HARDWARE CONTROL FOR REPEATING PROGRAM LOOPS IN ELECTRONIC COMPUTERS.

4,098,030. METHOD FOR FORMING A NARROWED-ELECTRODE PICKUP STYLUS FOR VIDEO DISC SYSTEMS.

4,098,301. METHOD TO PROVIDE HOMOGENEOUS LIQUID CRYSTAL CELLS CONTAINING A DYESTUFF.

4,098,511. VIDEO DISC HANDLING SYSTEM FOR A VIDEO DISC PLAYER.

4,099,041. SUSCEPTOR FOR HEATING SEMICONDUCTOR SUBSTRATES.

4,099,085. PARALLEL VANE STRUCTURE FOR A FLAT DISPLAY DEVICE.

4,099,087. GUIDED BEAM FLAT DISPLAY DEVICE WITH FOCUSING GUIDE ASSEMBLY MOUNTING MEANS.

4,099,187. SHADOW MASK COLOR PICTURE TUBE HAVING A MOSAIC COLOR SCREEN WITH IMPROVED TOLERANCES.

4,099,372. TIMEKEEPING APPARATUS WITH POWER LINE DROPOUT PROVISIONS.

4,099,417. METHOD AND APPARATUS FOR DETECTING ULTRASONIC ENERGY.

4,099,724. AUTOMATIC DISC WIPING APPARATUS.

4,099,924. APPARATUS IMPROVEMENTS FOR GROWING SINGLE CRYSTALLINE SILICON SHEETS.

4,099,997. METHOD OF FABRICATING A SEMICONDUCTOR DEVICE.

4,100,313. PROCESS FOR FORMING AN OPTICAL WAVEGUIDE.

4,100,449. UNIFORM FILAMENT AND METHOD OF MAKING THE SAME.

4,100,465. TURNTABLE SPEED CONTROL SYSTEM.

4,100,508. SEMICONDUCTOR LASER HAVING FUNDAMENTAL LATERAL MODE SELECTIVITY.

4,100,518. ECCENTRIC CONVERGENCE APPARATUS FOR IN-LINE BEAM CATHODE RAY TUBES.

4,100,561. PROTECTIVE CIRCUIT FOR MOS DEVICES.

4,100,565. MONOLITHIC RESISTOR FOR COMPENSATING BETA OF A LATERAL TRANSISTOR.

4,101,402. ADHERENCE OF METAL FILMS TO POLYMERIC MATERIALS.

4,101,802. FLAT DISPLAY DEVICE WITH BEAM GUIDE.

4,101,814. SIDE PINCUSHION DISTORTION CORRECTION CIRCUIT.

4,101,815. HORIZONTAL DEFLECTION CIRCUIT WITH HIGH VOLTAGE SELECTION CAPABILITY.

4,101,823. METHOD AND APPARATUS FOR MEASURING CATHODE EMISSION SLUMP.

4,101,907. OVERCOAT STRUCTURE FOR OPTICAL VIDEO DISC.

4,101,926. TELEVISION SYNCHRONIZING APPARATUS.

4,102,560. OPTICAL COUPLER.

4,102,683. NONREFLECTING PHOTORESIST PROCESS.

4,103,183. QUASI-STATIC INVERTER CIRCUIT.

4,103,185. MEMORY CELLS.

4,103,188. COMPLEMETARY-SYMMETRY AMPLIFIER.

4,103,203. WAFER MOUNTING STRUCTURE FOR PICK-UP TUBE.

4,103,204. FLAT DISPLAY DEVICE WITH BEAM GUIDE.

4,103,205. FLAT DISPLAY DEVICE WITH BEAM GUIDE.

4,103,219. SHUNT VOLTAGE REGULATOR.

4,103,228. MEHOD FOR DETERMINING WHETHER HOLES IN DIELECTRIC LAYERS ARE OPENED.

4,103,246. SWITCHABLE CURRENT AMPLIFIER.

4,103,262. DUAL CHANNEL TRANSMISSION OF MICROWAVE POWER THROUGH AN INTERFACE OF RELATIVE ROTATION.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licenses by the agency which filed the case.

Requests for licensees information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE ARMY

Office of Judge Advocate, Patent Division, RM 2C–455
Pentagon, Washington, D.C. 20314

Patent 3,905,129. True Dimensioning and Tolerancing Demonstrator. Filed May 24, 1974. Patented Sept. 16, 1975. Not available NTIS.

Patent 4,034,285. Superheterodyne Noise Measuring Discriminators. Filed Aug. 30, 1976. Patented July 5, 1977. Not available NTIS.

Patent 4,035,088. High Energy Laser Beam Sampling Meter. Filed Aug. 5, 1975. Patented July 12, 1977. Not available NTIS.

Patent 4,036,170. Means for Applying Zinc Stearate Coatings to the Bore Surfaces of Ferrous Alloy Tubes. Filed Oct. 10, 1975. Patented July 19, 1977. Not available NTIS.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 743,375. Charge Exchange System. Filed Nov. 19, 1976.

Patent 3,932,657. Liposome Encapsulation of Chelating Agents. Filed Nov. 12, 1973. Patented Jan. 13, 1976. Not available NTIS.

Patent 4,017,163. Angle Amplifying Optics Using Plane and Ellipsoidal Reflectors. Filed Apr. 16, 1976. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,017,578. Method for Producing Laser Targets. Filed June 12, 1975. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,021,280. Method of Making Foam-Encapsulated Laser Targets. Filed Sept. 2, 1975. Patented May 3, 1977. Not available NTIS.

Patent 4,031,921. Hydrogen-Isotope Permeation Barrier. Filed Sept. 9, 1975. Patented June 28, 1977. Not available NTIS.

Patent 4,034,032. Method for Foam Encapsulating Laser Targets. Filed Sept. 2, 1975. Patented July 5, 1977. Not available NTIS.

Patent 4,038,125. Method for Mounting Laser Fusion Targets for Irradiation. Filed June 18, 1975. Patented July 26, 1977. Not available NTIS.

Patent 4,054,686. Method for Preparing High Transition Temperature Nb Sub 3 Ge Superconductors. Filed June 26, 1975. Patented Oct. 18, 1977. Not available NTIS.

Patent 4,055,782. Method of Enhancing Cyclotron Beam Intensity. Filed Apr. 22, 1977. Patented Oct. 25, 1977. Not available NTIS.

Patent 3,930,405. Method and Means for Measuring Acoustic Emissions. Filed Sept. 17, 1974. Patented Jan. 6, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research—
Code 302, Arlington, Va. 22217

Patent 4,066,819. Method of Bonding Gold Films to Non-Electrically Conducting Oxides and Product Thereby Obtained. Filed Oct. 21, 1971. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,073,590. Laser Total Reflectometer. Filed Nov. 18, 1976. Patented Feb. 14, 1978. Not available NTIS.

Patent 4,076,524. Reduction in Swelling of Iron Caused by Irradiation. Filed Nov. 15, 1973. Patented Feb. 28, 1978. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

Patent application 706,073. Method of Controlling Defect Orientation in Silicon Crystal Ribbon Growth. Filed July 16, 1976.

Patent application 894,213. Method and Apparatus for Holding Two Separate Metal Pieces Together for Welding. Filed Apr. 6, 1978.

Patent application 897,830. Active Nutation Controller. Filed Apr. 19, 1978.

Patent application 900,842. High-Temperature Microphone System. Filed Apr. 28, 1978.

Patent application 900,843. Combined Solar Collector and Energy Storage System. Filed Apr. 28, 1978.

Patent application 897,831. Portable Heatable Container. Filed Apr. 19, 1978.

Patent application 897,832. Underground Mineral Extraction. Filed Apr. 19, 1978.

Patent application 900,848. Negative Ion Source. Filed Apr. 28, 1978.

Patent application 901,054. Limited Scan Dual-Band High Gain Antenna. Filed Apr. 28, 1978.

Patent application 901,055. A Method of Growing a Ribbon Crystal Particularly Suited for Facilitating Automated Control of Ribbon Width. Filed Apr. 28, 1978.

Patent application 901,056. Versatile Transponder Receiver. Filed Apr. 28, 1978. Not available NTIS.

Patent application 906,298. Method and Apparatus for Slicing Crystals. Filed May 15, 1978.

Patent application 906,299. Crystalline Polyimides. Filed May 16, 1978. Not available NTIS.

Patent 4,077,813. Method of Producing Complex Aluminum Alloy Parts of High Temper, and Products Thereof. Filed July 26, 1976. Patented Mar. 7, 1978. Not available NTIS.

Patent 4,077,921. Sprayable Low Density Ablator and Application Process. Filed Jan. 19, 1977. Patented Mar. 7, 1978. Not available NTIS.

Patent 4,078,175. Apparatus for Use in Examining the Lattice of a Semiconductor Wafer by X-Ray Diffraction. Filed Sept. 20, 1976. Patented Mar. 7, 1978. Not available NTIS.

Patent 4,078,290. Stator Rotor Tools. Filed Nov. 8, 1976. Patented Mar. 14, 1978. Not available NTIS.

Patent 4,078,378. Automotive Gas Turbine Fuel Control. Filed Nov. 8, 1976. Patented Mar. 14, 1978. Not available NTIS.

Patent 4,080,901. Molded Composite Pyrogen Igniter for Rocket Motors. Filed Apr. 20, 1976. Patented Mar. 28, 1978. Not available NTIS.

Patent 4,082,001. Non-Destructive Method for Applying and Removing Instrumentation on Helicopter Rotor Blades. Filed Apr. 19, 1977. Patented Apr. 4, 1978. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 26, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-4-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-1-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-14-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-25-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-19-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-3-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-30-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-22-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-29-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-18-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	10-6-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-13-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-15-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-24-77

Expiration of patents: The patents within the range of numbers indicated below expire during August 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,994,087 to 2,998,605, inclusive
Plant Patents..... Numbers 2,085 to 2,094, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED OCTOBER 3, 1978

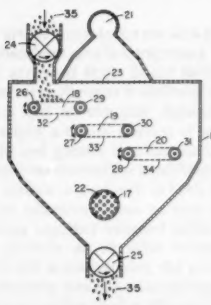
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T975,001
APPARATUS FOR CONDITIONING SEED COTTON

Gino J. Mangialardi, Jr., Greenville, and Anselm C. Griffin, Jr., Leland, both of Miss., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 28, 1977, Ser. No. 846,478
Int. Cl.[2] D01B *9/00*
U.S. Cl 19—66 CC
4 Sheets Drawing. 16 Pages Specification



An apparatus for conditioning seed cotton during the ginning operation is disclosed. Seed cotton which is to be conditioned to a proper moisture content is fed through a rotating vacuum seal dropper onto a series of moving belts located within a conditioning chamber. The moving belts are arranged to retain the seed cotton for a predetermined critical period within the chamber. Conditioned air is circulated through the chamber and brought into intimate contact with the seed cotton thereby properly adjusting the moisture content. The seed cotton is then vented through a rotating vacuum seal dropper into gin processing equipment.

T975,002
METHOD FOR CONTROLLING BIOFOULING IN DRIP IRRIGATION SYSTEM EMITTER ORIFICES

Frederick William Linda, Florence, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jul. 27, 1977, Ser. No. 819,532
Int. Cl.[2] C02B *3/06*
U.S. Cl. 210—62
No Drawing. 18 Pages Specification

An improved method for controlling biofouling in drip irrigation system emitter orifices wherein a chlorinated derivative of cyanuric acid, such as trichloroisocyanuric acid, dichloroisocyanuric acid, sodium dichloroisocyanurate, and its hydrates or mixtures thereof, is employed as the chlorinating source. The chlorinated derivative of cyanuric acid is metered into the irrigation water at a point near the main irrigation water supply pump in an amount sufficient to meet the chlorine demand of the irrigation water and to provide a residual chlorine content of about 0.5 ppm available chlorine in the irrigation water at the drip emitter most distant from the chlorination point.

T975,003
PRIMER COATING COMPOSITIONS COMPRISING POLYALKYLENEIMINE AND CELLULOSE-ACETATE PROPIONATE

Don R. Leonard, Rte. 15, 421 Old Castle Rd., and Charles H. Coney, 2008 Canterbury Rd., both of Kingsport, Tenn. 37660

Continuation of Ser. No. 779,433, Mar. 21, 1977, abandoned. This application Nov. 7, 1977, Ser. No. 849,376
Int. Cl.[2] B05D *7/10;* **B32B** *21/08, 27/10*
U.S. Cl. 427—407 R
No Drawing. 13 Pages Specification

Coating compositions comprising polyalkyleneimine and cellulose acetate propionate in solution, and related process and product, are disclosed. Such compositions are particularly useful as primer coatings for substrates of regenerated cellulose, paper and paperboard where cellulose ester top coatings are used. Use of such compositions as primer coatings improves adhesion of the top coating to the substrate, particularly where the coated substrate is heat-sealed, for example, in packaging applications. Also, the coating composition provides increased resistance to blocking, which is especially important where the substrate is sheet material wound in a roll.

T975,004
OIL-FREE, PRESSURE SENSITIVE ADHESIVE

David R. Hansen, and George T. Coker, Jr., both of Houston, Tex., assignors to Shell Oil Company

Filed Jan. 31, 1978, Ser. No. 873,819
Int. Cl.[2] C08L *45/00*
U.S. Cl. 260—829
No Drawing. 9 Pages Specification

An oil-free, pressure sensitive adhesive composition comprises a monoalkenyl arene/isoprene block copolymer, a tackifying resin compatible with the isoprene block and a predominately aromatic second resin compatible with the monoalkenyl arene block. These adhesive compositions possess excellent adhesive properties along with a lower melt viscosity and lower cost.

REISSUES

OCTOBER 3, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,789

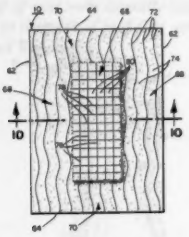
ABSORBENT ARTICLES FOR DISPOSABLE DIAPER

Charles G. Kolbach, Media, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Original No. 3,860,002, dated Jan. 14, 1975, Ser. No. 360,124, May 14, 1973. Application for reissue Nov. 20, 1975, Ser. No. 634,826

Int. Cl.[2] **A61F** *13/16*

U.S. Cl. 128—284 **22 Claims**



1. An absorbent article suitable for use as a disposable diaper and the like; said absorbent article comprising a unitary assemblage of randomly arranged fibers in the form of a web, said web having a transverse dimension defined between spaced, elongate side edges and an elongate dimension defined between spaced end edges; a medial portion of said web having a greater basis weight and greater average thickness than flanking end and side portions thereof for establishing a step configuration in a upper surface of said web in both the elongate and transverse direction; adhesive means on said upper surface of said web for bonding together exposed surface fibers in said upper surface to provide an abrasion resistant, non-piling, facing layer, and to aid in maintaining the structural integrity of said web and stabilizing means for stabilizing a lower surface of said web; said upper surface being adapted to be positioned in contact with a wearer with the medial portion of the web in the perineal region, the flanking side portions about the thigh regions, and the flanking end portions about the front and back regions.

Re. 29,790

PROCESS FOR HANDLING FLUIDS IN HEAT TRANSFER EQUIPMENT

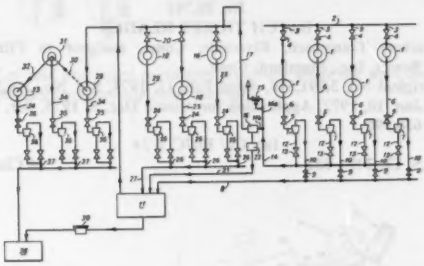
Abraham C. Miselem Asfura, Pachuca No. 87-102, Mexico City, D.F., Mexico

Original No. 3,828,843, dated Aug. 13, 1974, Ser. No. 322,198, Jan. 9, 1973. Application for reissue Sep. 6, 1974, Ser. No. 503,626

Int. Cl.[2] **F26B** *13/18*

U.S. Cl. 165—1 **12 Claims**

1. Process for handling fluids in heat transfer apparatus, comprising the steps of providing a first group of heat transfer units, feeding *a flow of* steam to this first group, through a common header; connecting the outlets of said heat transfer units to first modified steam-trap units [to traps] that separate condensate and extraction steam, *thereby providing a flow of condensate separate from a flow of extraction* steam; piping the condensate flow through a common header to a flash tank and feeding the *flow of* extraction steam to a second group of heat transfer units, through a separator and an air eliminator; [in this second group of heat transfer units, the steam is passed through corresponding steam traps, but in this case the steam traps] *feeding the flow of extraction steam to the second group of heat transfer units, through a common header; connecting the outlets of the second group of heat-transfer units to second steam modified traps, the second steam traps being connected to* discharge, both the extraction steam and the condensate, together through a header to the flash tank; *connecting* said flash tank *to feed* [feeds] the flash steam through a pipe to one of the heat transfer units of a third group, that operates at the lowest



pressure of all groups; [from this unit, steam is extracted to the next unit and from the latter to a third unit,] *extracting steam from said one unit and feeding the same to a second unit of the third group, and extracting steam from said second unit and feeding the same to a third unit of the third group,* producing by [this] *such* extraction an automatic pressure drop from one unit to the next.

Re. 29,791

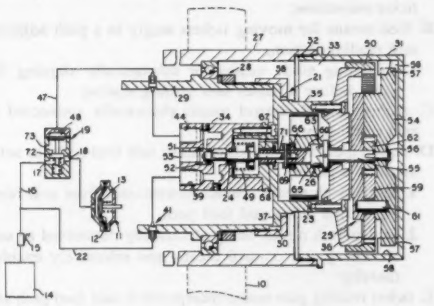
ANTI-SKID CONTROL DEVICE AND SYSTEM

Walter H. Morse, South Windsor, and Ira R. Ames, Jr., Salisbury, both of Conn., assignors to The Jacobs Manufacturing Company, West Hartford, Conn.

Original No. 3,908,805, dated Sep. 30, 1975, Ser. No. 431,952, Jan. 9, 1974. Application for reissue Sep. 28, 1977, Ser. No. 837,748

Int. Cl.[2] **B60T** *8/16*

U.S. Cl. 188—181 A **39 Claims**



20. An anti-wheel lock-up control device for controlling lock-up in a wheel of a motor vehicle having a braking mechanism, comprising: an input drive shaft having a drive connection; flywheel means, supported in the control device for rotation and axial movement relative to the input drive shaft; axially disengageable cam toothed clutch means, including a driven member, carried by the flywheel means and normally engaging a driving member, carried by the input drive shaft; signal means responsive to axial

movement of the flywheel means relative to the input drive shaft amd axially shiftable from a first position to a second position; and spring means constantly biasing the signal means axially towards its first position and towards the flywheel means; the driven clutch member being axially disengageable from the driving clutch member to shift the flywheel means axially and, as a result, to shift the signal means axially from its first position to its second position as a consequence of a sudden deceleration of the driving clutch member.

Re. 29,792

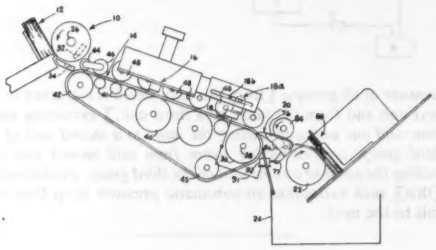
BATCH TICKET READER

Herbert Tramposch, Riverside, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Original No. 3,791,516, dated Feb. 12, 1974, Ser. No. 216,536, Jan. 10, 1972. Application for reissue Dec. 8, 1975, Ser. No. 638,596

Int. Cl.[2] B07C *3/14*

U.S. Cl. 209—583 **14 Claims**



1. Batch ticket processing apparatus, comprising in combination:

A. a reading station having means for reading information encoded on tickets to be processed, *said reading station being provided with at least two light sources and two detectors in adjacent positions and laterally spaced apart relationship, each of said detectors being positioned along an axis normal to said path to read ticket encoded information for each possible end-for-end orientation of a ticket, whereby ticket information may be read regardless of end-for-end ticket orientation;*

B. feed means for moving tickets singly in a path adjacent said reading station,

1. including guide means for substantially aligning the ticket before it passes said reading station;

C. recording and control means electrically connected to said reading means;

D. switch means positioned adjacent said feed path for actuation by a ticket,

1. said switch means spaced downstream from said reading station along said feed path,

2. said switch means being electrically connected to said recording and control means and selectively enabled thereby;

E. ticket routing gate means interposed in said feed path and spaced downstream from said switch means for diverting tickets to one of two routes,

1. said gate means being electrically energized through said switch means upon the coincidence of enablement by said recording and control means and actuation by a ticket, whereby a ticket is diverted to one of said two routes depending upon whether or not information is accurately read therefrom as determined and controlled by said recording and control means.

Re. 29,793

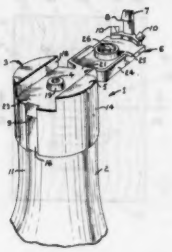
CONTAINER COVER AND SAFETY CLOSURE

Harold T. Pehr, 3920 W. 96th St., Overland Park, Kans. 66207

Original No. 4,022,352, dated May 10, 1977, Ser. No. 680 524, Apr. 26, 1976. Application for reissue Sep. 29, 1977, Ser. No. 837,916

Int. Cl.[2] B65D *5/32*

U.S. Cl. 222—153 **15 Claims**



1. A safety container comprising:

a. container body having a side wall and a top wall, said top wall having a material dispensing aperture;

b. a closure member hingedly mounted on said top wall, said closure member being defined by a wall portion having a peripheral edge;

c. means on said closure member for closing the material dispensing aperture when said closure member is in covering relation with said material dispensing aperture;

d. a latch member on one of said closure member and container, said latch member extending from the peripheral edge of said wall portion of said closure member;

e. cooperating means on the other of said closure member and said container and on said latch member and engageable one with the other for retaining said closure member in covering relation with said material dispensing aperture;

f. resilient means on one of said closure member and said container for urging said cooperating means into retaining engagement, a portion of said closure member being movable toward said container against resistance of said resilient means to permit separation of said cooperating means on said latch member and other of said closure member and container; and

g. said cooperating means for retaining said closure member in covering relation with said material dispensing aperture includes:

1. a downwardly inclined shoulder on said side wall of said container body; and

2. an upwardly inclined shoulder on said latch member and engageable with said downwardly inclined shoulder on said container body whereby said resilient means urge said latch member shoulder into engagement with said container body shoulder.

Re. 29,794

METHOD OF PRODUCING WEB UNITS

James B. Fulk, Monte Sereno, Calif., assignor to Paper Converting Machine Company, Green Bay, Wis.

Original No. 3,596,899, dated Aug. 3, 1971, Ser. No. 859,020, Sep. 18, 1969. Application for reissue Dec. 8, 1975, Ser. No. 638,767

Int. Cl.[2] **B65H** *41/00*

U.S. Cl. 270—52.5 **11 Claims**

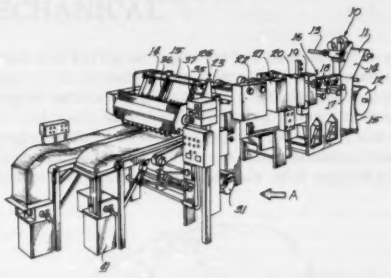
15. A method of manufacturing business forms from rolls of paper webs comprising:

advancing the webs from the rolls into a contiguous superimposed relationship along a common straight line path, processing the webs simultaneously while they are moving in said superimposed relationship,

maintaining a first one of the webs along said straight line path

advancing a second of said webs laterally into a path which is parallel to the path of said first web to separate said first and second webs and

performing a further processing operation on said first and second webs after said separation,



all of said processing operations occurring while the webs are moving continuously from said rolls.

PATENTS

GRANTED OCTOBER 3, 1978

GENERAL AND MECHANICAL

4,117,552

PROTECTIVE CLOTHING

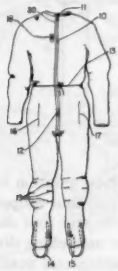
Robert Emmerson Simpson, Fleet, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 13, 1977, Ser. No. 796,707

Claims priority, application United Kingdom, May 14, 1976, 20136/76

Int. Cl.[2] A62B *17/00*

U.S. Cl. 2—2.1 A **5 Claims**



1. A garment liner for wearing between inner and outer garments having a torso member with a neck region thereto, two leg members and two arm members and wearable by a human subject to cover at least his torso, arms and legs, said garment liner being formed of a fabric comprising a layer of air-permeable cloth treated with an oleophobic compound to render the designated outer surface thereof liquid repellent and having activated carbon approximate the designated inner surface thereof, said arm and leg members being long enough satisfactorily to envelop the arms and legs respectively of the longest limbed subject for whom said garment is otherwise suitable, said garment also having elasticated adjustable stirrups operative in use to maintain envelopment of each whole leg by said leg members, one stirrup anchored within each leg member at a station above that required for the stirrups satisfactorily to maintain leg member envelopment of the legs of the shortest legged subject for whom said garment is otherwise suitable, whereby excess garment leg fabric can be cut away or turned up, a donning, doffing and access fastener means extending from said neck region down the designated front of said garment at least to a crotch region between said leg members, said fastener means being both selectively openable to permit access to said crotch region for the purpose of urination and completely openable for donning/doffing purposes, and said arm and leg members being provided with excess fabric in outer elbow and knee regions thereof.

4,117,553

HELMET SHIELD AND VISOR APPARATUS

William P. Bay, Rte. 1, Box 53, Ormond Beach, Fla. 32974

Filed Apr. 12, 1977, Ser. No. 786,900

Int. Cl.[2] A61F *9/00;* **A42B** *1/08*

U.S. Cl. 2—10 **7 Claims**

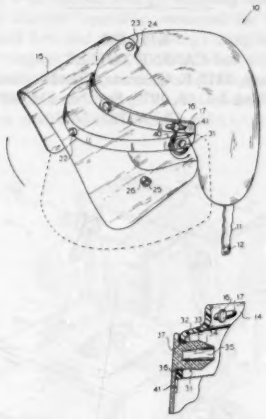
1. A helmet shield and visor combination comprising:

a visor having openings formed therein at pre-determined locations;

a visor attachment means for attaching said visor to a helmet;

a transparent shield for attachment to said visor; and

shield attachment means for rotatably attaching said shield to said visor, said shield attachment means having a pair of plastic studs formed thereon at pre-determined locations each stud having an angled surface thereon and an opening therein, and adapted to fit into said visor openings, said angled surface being adapted to rotatably hold said shield to said visor, said shield also being formed to bias said angled surfaces on said stud against the edge of said visor openings, said shield attachment means including means to wedge said shield against said visor upon rotation of said



visor, whereby said shield is rotatably attached to said visor, so that it may be moved to and held in different positions; and said transparent shield having a center snap fastener portion formed therein for attaching to a snap fastener portion on said visor at a pre-determined location to hold said shield in a pre-determined position on said visor.

4,117,554

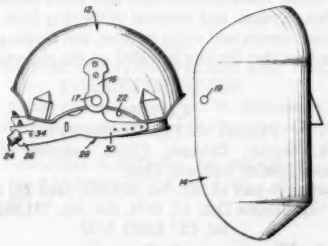
PROTECTIVE HARD HAT AND WELDER'S HOOD

Julius T. Palumbo, Sulphur, La., assignor to Arthur J. Planchard, Sulphur, La., a part interest

Filed May 17, 1977, Ser. No. 797,743

Int. Cl.[2] A42B *3/00*

U.S. Cl. 2—418 **10 Claims**



1. Head protective apparatus, comprising:

hat means for fitting over at least the external upper portions of the cranium of a wearer, the hat means being formed of a substantially rigid, protective material;

suspension mounting means attached to interior surfaces of the hat means for mounting the hat means on the head of a wearer, the suspension mounting means including an annular bandlike strap means which is discontinuous along

a portion thereof, ends of the strap means at the discontinuous portion being spaced apart; and,

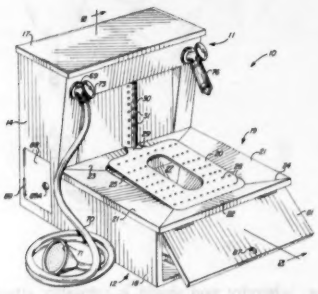
an elastically deformable band disposed between the spaced ends of the strap means and adjustably connected thereto to lengthen and shorten that portion of the band lying between said spaced ends, the spaced ends of the strap means and the deformable band held therebetween being disposed outwardly of the hat means and exposed to be grasped at one end of the deformable band for adjustment of the fit of the suspension mounting means on the head of the wearer.

4,117,555

CANINE TOILET

Bethel E. Dennis, 3115 E. Glenrosa, Phoenix, Ariz. 85016

Filed Jul. 15, 1977, Ser. No. 815,949
Int. Cl.[2] A47K *17/00*
U.S. Cl. 4—1 **10 Claims**



1. In a canine toilet, including a cabinet having a rear upright portion and a forwardly extending extension; a source of water in said upright portion and a hingedly mounted toilet seat pedestal in the forward extension, the improvement consisting of:

(a) a defecating slot in said toilet seat pedestal;

(b) a flush bowl immediately below said toilet seat pedestal;

(c) a flushing system for said bowl connected to said water supply by a water system including a valve;

(d) means for biasing said toilet seat pedestal in a canted position with the rear portion thereof upraised; and

(e) means for connecting the rear portion of said toilet seat pedestal to said valve,

whereby a dog seated on said toilet seat pedestal opens said valve to cause water to flow from said water supply through said flushing system, and removal of the dog from said toilet seat pedestal causes said valve to close, and flushing continues all of the time that the dog is seated on the pedestal.

4,117,556

FLUSH WATER CONSERVER

Oskar A. Semler, Belmont, Calif., assignor to Eleonore Josephine Semler, Belmont, Calif.

Continuation-in-part of Ser. No. 690,958, May 28, 1976. This application Dec. 17, 1976, Ser. No. 751,682
Int. Cl.[2] E03D *5/02*
U.S. Cl. 4—325 **6 Claims**

1. A flush toilet, comprising:

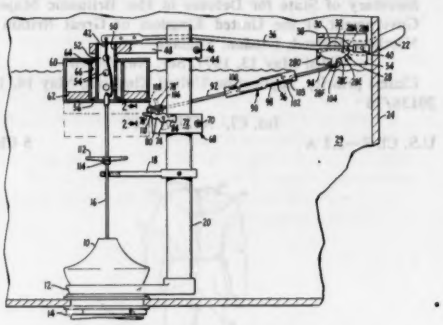
a single operating handle operable in a first direction to produce a full flush and operable in a second direction to produce a short flush;

flush ball means for permitting the outflow of flush water from the flush toilet tank when withdrawn from its seat by operation of said operating handle in either direction;

auxiliary float means for bearing upon said flush ball means and urging said flush ball means towards its seat when the surface of the water in said tank has receded from its quiescient level by a predetermined distance; and

latch means for preventing said auxiliary float means from dropping far enough to bear upon said flush ball means when latched;

said latch means, if unlatched, being moved in a latching



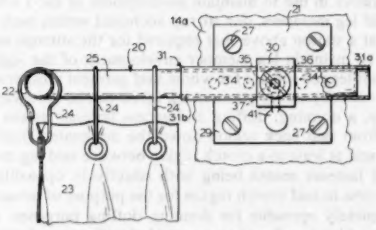
direction to a latching position for preventing said auxiliary float means from thus dropping when said operating handle is moved in said first direction, and, if latched, being moved in an unlatching direction to a non-latching position for permitting said auxiliary float means to bear upon said flush ball means when said operating handle is moved in said second direction.

4,117,557

HORIZONTALLY ADJUSTABLE CURTAIN RODS FOR BATHROOM STALLS

Walter G. McPeak, 3505 Kilkenny, West, Tallahassee, Fla. 32303, and James K. Myhand, P.O. Box 37, Pine Mountain, Ga. 31822

Filed Jun. 27, 1977, Ser. No. 810,382
Int. Cl.[2] A47K *3/14*; A47H *1/022*
U.S. Cl. 4—149 **3 Claims**



1. In a bath compartment (**10**) having a back wall (**12**), a pair of side walls (**14, 15**), a front doorway (**19**) between said side walls, a U-shaped rod assembly (**20**) including a pair of parallel leg segments (**25, 25**) and an intermediate trough segment (**26**) lying substantially in a common plane, and means for suspending a curtain (**23**) from said leg and trough segments, in combination with means for cantilevering said assembly for back and forth bodily movement in a retilinear path through said doorway comprising

a pair of juxtaposed hubs (**30, 30**) cantilevered respectively from said side walls and inwardly of said compartment;

a pair of parallel sleeves (**31, 31**) for telescopically receiving said leg segments (**25, 25**) respectively, and

means for fixedly mounting each of said sleeves (**31, 31**) transversely upon the free end portion of its associated cantilevered hub (**30**) and in spaced relation to its proximate side wall, the opposite end portions (**31*a*, 31*b***) of said

sleeve being cantilevered from its mount rearwardly and forwardly of said compartment respectively,

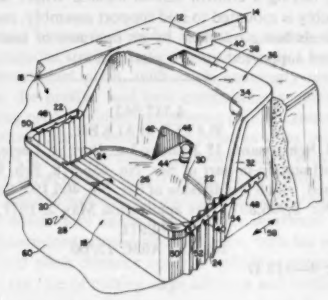
whereby said rearwardly cantilevered sleeve portions (**31***a*, **31***a*) will react downwardly to the weight of the cantilevered assembly (**20**) and said forwardly cantilevered sleeve portions (**31***b*, **31***b*) will react upwardly.

4,117,558

COLLAPSIBLE TUB INSERT

Robert Poth, 1048 Val Martin, Laval, Canada (H7V 3K5)

Filed Oct. 20, 1977, Ser. No. 843,868
Int. Cl.[2] **A47K** *3/00, 3/06*
U.S. Cl. 4—173 R **7 Claims**



1. A collapsible tub insert comprising

a container having a base and walls extending upwardly therefrom, said base and said walls defining an open mouth portion residing above said base and adjacent the upper most marginal edges of said walls, a pair of portions of said walls having a pleated-like cross-section, said pleated-like cross-section defined by a plurality of vertical lines extending upwardly from said base to said marginal edges, a portion of said base having a pleated-like construction, said pleated-like construction of said base defining a plurality of horizontal lines, said plurality of horizontal lines intersecting said plurality of vertical lines, another portion of said walls having the upper most marginal edge thereof residing substantially in the same plane as the marginal edges of said pair of portions of said walls, the remaining portion of said walls having the marginal edge thereof extending upwardly from said marginal edge of said pair of portions,

a passageway located in said remaining portion of said wall, one end of said passageway located in said marginal edge of said remaining portion of said walls, the other end of said passageway fluidly communicating to said base and extending passing through an opening in the interior surface of said remaining portion of said wall, said opening being located adjacent said base, said passageway having a drainage hole communicating to an exterior surface of said remaining portion of said walls,

a stopper, said stopper removably installed closing said drainage hole, means to manually position said portion of said walls at selected locations away from said remaining portion of said walls.

4,117,559

BATHROOM DEODORIZER AND ODORIZER DEVICES AND METHODS OF MAKING AND USING THE SAME

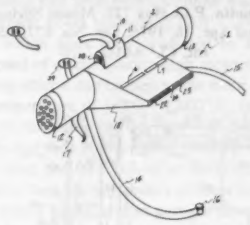
Delbert D. Boyle, 1354 Lee Dr., Edwardsville, Ill. 62025

Filed May 31, 1977, Ser. No. 801,471
Int. Cl.[2] **E03D** *9/04*
U.S. Cl. 4—209 R **1 Claim**

1. A bathroom deodorizer and odorizer device for use with a conventional toilet bowl comprising,

housing means, said housing means provided with a motor chamber therein, said housing means provided with first and second inlet ports and chambers and first and second outlet ports and chambers, said first inlet port and chamber communicating with said first outlet port and chamber and said second inlet port and chamber communicating with said second outlet port and chamber,

motor means provided with a first and second shaft and fan means operably mounted in said motor chamber, said first fan means disposed in said first outlet chamber and said second fan means disposed in said second outlet chamber, said motor means provided with first energy coupling means operably mounted thereon, a motor chamber cover provided with second energy coupling means operably mounted thereon operably mounted on said housing means, said first and second energy coupling means disposed to engage with each other when said cover is in place, said housing means shaped in the form of an elongated cylinder with the axis thereof essentially parallel to said motor shaft means in combination with a bill portion



attached to external wall of said cylinder, said bill portion having a rectangular cross section which decreases in width as the distance from the cylinder increases, said inlet ports and chambers disposed transverse to the axis of said cylinder and within said bill portion, said outlet ports and chambers disposed longitudinally within said cylinder,

deodorizing and odorizing wafers removably disposed in said first and second inlet chambers apertured and covers operably mounted on said outlet ports at opposite ends of said cylinder,

bowl seal means operably disposed proximate said housing means,

switching means operably disposed in said seal means and operably connected to said energy coupling means on said motor chamber cover, said housing means shaped to fit within the open contour of a conventional bowl and lid and

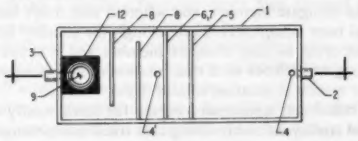
clip means mounted on said housing means.

4,117,560

APPARATUS FOR TREATING FLUIDS AND TREATING TABLETS THEREFOR

William E. Kidon, Chardon, and Neil W. Stillman, Madison, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

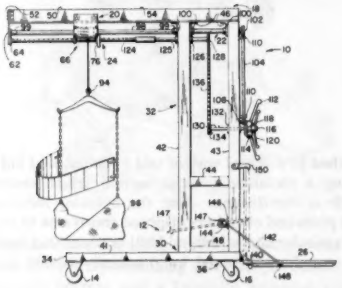
Filed Jun. 8, 1977, Ser. No. 804,639
Int. Cl.[2] **E03D** *1/00;* **C02C** *1/40, 1/00*
U.S. Cl. 4—321 **12 Claims**



1. An apparatus for treating fluid which comprises a con-

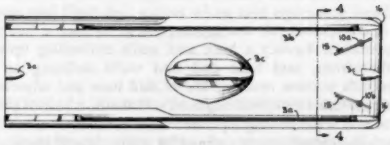
tainer for temporarily receiving a fluid therethrough, said container including an inlet means for introducing the fluid into said container, and an outlet means for discharging the fluid from said container, at least one holding means for a treating agent, the holding means being in open communication with said outlet means, with the fluid in said container and with the exterior of the container for recharging the treating agent, said holding means having the treating agent therein exposed to contact with the fluid and requiring passage of said fluid through said holding means in close proximity to the treating agent before exiting via the outlet means, and a baffle means interposed between said inlet means and said holding means, said baffle means comprising an underflow weir associated with a downstream overflow weir wherein the fluid passing under the underflow weir must first rise before going over the overflow weir.

4,117,561
PATIENT LIFT DEVICE
Rodvinon I. Zamotin, P.O. Box 721, Miami Springs, Fla. 33166
Filed Apr. 16, 1976, Ser. No. 677,805
Int. Cl.[2] A61G *7/10*
U.S. Cl. 5—83 **10 Claims**



1. A patient lift device comprising
a support assembly;
an elongate, substantially horizontal boom assembly supported by said support assembly and comprising a substantially horizontal track;
movable suspension means for suspending a means for holding a patient comprising
a travelling trolley assembly mounted on and movable over said track, said trolley assembly comprising a rigid frame and a plurality of wheels rotatably mounted to said frame at the upper ends thereof for movable engagement with said track, said frame having a threaded orifice therein, the axis of which extends in the longitudinal direction,
and vertical adjustment means for vertically moving the patient holding means comprising a drum horizontally rotatably mounted to and carried by said trolley assembly, a flexible cable means having one end wound around said drum and the other end for connecting to the patient carrying means and means for rotating said drum for raising and lowering the other end of said cable, said drum rotating means comprising an elongate member rotatably mounted on said boom assembly and means for rotating said elongate member, and wherein said drum has a central bore completely therethrough for slidably mounting said drum on said elongate member and is keyed to said elongate member such that rotation of said elongate member results in rotation of said drum;
and horizontal adjustment means for horizontally moving said trolley assembly along said track comprising a rotatably mounted threaded shaft in threaded engagement with said trolley assembly and means for rotating said threaded shaft such that rotation thereof results in axial movement of said trolley assembly with said drum along said track, said threaded shaft rotating means comprising
an upstanding post assembly rigidly mounted to said support assembly, a first hand wheel rotatably mounted on said post assembly and linkage transferring the rotation of said hand wheel to said threaded shaft, and said elongage member rotating means comprises a second hand wheel concentrically rotatably mounted with said first hand wheel and linkage transferring the rotation of said second hand wheel to one end of said elongate shaft,
said device further comprising a platform mounted to said support assembly at the location where said post assembly is mounted to said support assembly, said support assembly having a control station located where said post assembly is mounted to said support assembly, and said hand wheels being operable by an operator of said lift device when supported by said platform.

4,117,562
WATER WALKER
Peter H. Schaumann, 15 Jasmine La., Port St. Lucie, Fla. 33452
Continuation-in-part of Ser. No. 656,578, Feb. 9, 1976, abandoned, which is a division of Ser. No. 400,193, Sep. 21, 1973, Pat. No. 3,936,897. This application May 2, 1977, Ser. No. 792,571
Int. Cl.[2] A63C *15/00*
U.S. Cl. 9—310 D **9 Claims**



1. Apparatus for enabling an individual to walk on water including a pair of elongated buoyant water walker assemblies adapted for attachment to the feet of such individuals, each of said assemblies comprising:
a buoyant flotation member;
a runner member extending longitudinally along a substantial portion of the bottom of said buoyant member, said runner member having side walls forming a hollow section extending along its entire longitudinal length and being open at both longitudinal ends;
a cover member covering the bottom of said hollow section of said runner member;
control means arranged within said hollow section of said runner and being movable between a first position for allowing movement of said buoyant member in a forward direction and a second position for preventing slippage of said buoyant member in a rearward direction; and
said runner member further including a longitudinally extending member spaced between said side walls of said runner member so as to form two longitudinally extending hollow sections within said runner member and said control means including two pivotable plates mounted along a vertical axis within each of said hollow sections and being pivotable between an open position so that as said water walker moves in a forward direction water is allowed to pass through said hollow section and a closed position in which said plates substantially closes said hollow section and blocks passage of water through said hollow section thereby retarding movement of said buoyant member, as well as a stop mounted in said hollow section for each of said pivotable plates for holding said pivotable plates inclined relative to the water flow through said hollow section with said plates in the open position.

4,117,563

THREAD CHASER TOOL FOR CONTIGUOUS STRAIGHT AND TAPERED THREAD RUNS

John V. Fredd, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 555,639, Mar. 5, 1975, Pat. No. 3,940,764. This application Nov. 29, 1976, Ser. No. 745,799
Int. Cl.[2] B23G *1/00*; B26D *1/12*
U.S. Cl. 10—101 R 5 Claims

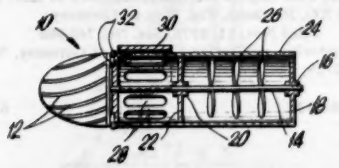
1. A thread chaser tool useful in cutting mating male and female contiguous straight tapered thread profiles having the same predetermined pitch, with pitch continuity maintained throughout the profile, said tool comprising: a cutting edge crest forming profile midway between a pair of symmetrically disposed, like-shaped root-forming point profiles with flank cutting edges contiguous with said crest forming profile; with the distance between said root-forming point profiles equal to the normal pitch distance of the male and female threads cut by said thread chaser tool minus a small space increment relative to the predetermined normal pitch distance; with the predetermined normal pitch distance being a definitive measurement function of the rate of cutting edge advance and cutting speed effected by relative rotation between said tool and the member to be threaded about the longitudinal axis of the member to be threaded.

4,117,564

OIL TANK CLEANING APPARATUS

Alberto Russo, 413 Waverley Ave., Mamaroneck, N.Y. 10543

Filed Sep. 6, 1977, Ser. No. 830,648
Int. Cl.[2] E04H *3/20*
U.S. Cl. 15—1.7 7 Claims



1. Apparatus comprising rotary cutting means for rotatably penetrating a surface, conduit means associated with said cutting means, said cutting means being rotatably mounted on shaft means, said cutting means having edge means extending therefrom and adapted to cut through a surface, said edge means being pitched sufficiently to propel said cutting means and said conduit means as said cutting means is rotated, impeller means operatively associated with said cutting means for rotating said cutting means, said conduit means being arranged to cause a fluid to impinge against said impeller means and thereby rotate said impeller means, said shaft means being mounted in a hollow housing, said conduit means operatively connected to said housing, opening means being provided in said housing next adjacent said cutting means for leading a fluid from said cutting means to said conduit means, said opening means having cap means thereon for partially blocking said opening means said cap means being movable on said housing to change the location of said opening means which may be blocked by said cap means.

4,117,565

CHROMIUM BASE ALLOY COMPOSITE MATERIALS REINFORCED WITH CONTINUOUS SILICON CARBIDE FIBERS AND A METHOD FOR PRODUCING THE SAME

Chiaki Asada, Nagoya; Katsushi Kusaka, Tokai, and Hisashi Kajima, Asahi, all of Japan, assignors to The Foundation: The Research Institute For Special Inorganic Materials, Japan

Filed Aug. 23, 1977, Ser. No. 827,060
Claims priority, application Japan, Aug. 31, 1976, 51/103829
Int. Cl.[2] B22F *3/14*
U.S. Cl. 75—204 4 Claims

1. Chromium base alloy composite materials reinforced with silicon carbide fibers obtained by incorporating silicon carbide fibers containing 0.01 – 20% by weight of free carbon into chromium base alloy consisting of 20 – 98% by weight of chromium and the remainder iron in a volume fraction of 5 – 20%.

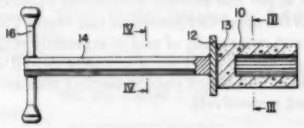
3. A method for producing chromium base alloy composite materials reinforced with silicon carbide fibers, which comprises laminating and arranging a volume fraction of 2 – 50% of silicon carbide fibers containing 0.01 – 20% by weight of free carbon which have been produced by heating the spun fibers composed of organosilicon high molecular weight compounds having silicon and carbon as the main skeleton components at a temperature of 1,000°– 2,000° C, in chromium base alloy powders consisting of 20 – 98% by weight of Cr and the remainder Fe and then compressing and sintering the resulting assembly to react the free carbon in the silicon carbide fibers with chromium base alloy powders to form carbides, whereby the binding ability of the silicon carbide fibers and chromium base alloy is increased.

4,117,566

VEHICULAR LUG NUT CLEANING DEVICE

Timothy J. Ward, New Orleans, La., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 27, 1977, Ser. No. 791,391
Int. Cl.[2] A47L *13/16*
U.S. Cl. 15—244 R 3 Claims



1. A vehicular lug nut cleaning device, comprising:

a sponge engageable with a lug nut, the sponge forming a shaftway extending from an outer face thereof and engageable with a side of the lug nut,

the shaftway having interiorly projecting ribs extending inwardly from an inner surface of the shaftway,

a shaft attached to a bottom plate,

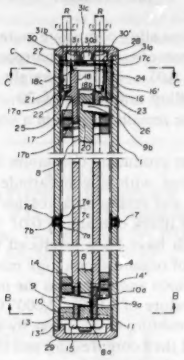
an adhesive material attached to a bottom of the bottom plate and attached to an inner face of the sponge, whereby the sponge is attached to the shaft, and

a cross handle attached perperdicularly to a distal end of the shaft for rotating the same.

4,117,567
DOOR CLOSER

Toyoaki Shimizu, Tokyo, Japan, assignor to Nikkey Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1977, Ser. No. 852,813
Claims priority, application Japan, Oct. 8, 1977, 52-135553[U]
Int. Cl.[2] E05F *3/20, 3/22*
U.S. Cl. 16—50 **8 Claims**



1. A door closer which comprises:

two hollow cylinders formed integrally with hinge pieces, respectively, said two cylinders being adjacent to each other in the axial direction thereof and rotatable with respect to each other around one and the same axis thereof; a support shaft penetrating said two cylinders; a coil spring surrounding said support shaft, said support shaft and coil spring being incorporated in said two cylinders; an intermediate rotary cylinder member provided between one end portion of said support shaft and the inner wall of first cylinder by inserting said one end portion of said support shaft thereinto, said intermediate rotary cylinder member being rotatable with respect to said support shaft and said first cylinder, the other end portion of said support shaft being provided in second cylinder in such a manner that said other end portion of said support shaft is not rotatable therein, one end portion of said coil spring being non-rotatably secured to said intermediate rotary cylinder member placed at the upper end portion of said first cylinder, while the other end portion of said coil spring being non-rotatably secured to the lower end portion of the second cylinder, grooves being formed at predetermined positions on the inner wall of the upper end portion of said first cylinder, the outer wall of the upper end portion of said support shaft, and the inner and outer walls of said intermediate rotary cylinder member, said grooves being rotatably moved so as to form two holes into which two connecting pins are detachably inserted respectively.

4,117,568
CRANK HANDLE FOR WINDOW REGULATOR SHAFT

Paul Bullock, Grosse Pointe Woods, Mich., assignor to Robin Products Company, Farmington Hills, Mich.

Filed Jan. 7, 1977, Ser. No. 757,541
Int. Cl.[2] G05G *1/10*
U.S. Cl. 16—110 R **3 Claims**

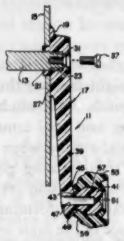
1. A crank handle for a window regulator shaft comprising a unit body of a plastic material including an elongated shank;

a head at one end of the shank on one side thereof having a transverse irregularly shaped bore adapted to frictionally receive said shaft for securing thereto;

a knob element of generally spherical shape at the other end of said shank as an integral part thereof and extending laterally to the opposite side thereof;

a hollow swivel knob of different plastic material having a spherically shaped bore, open at one end defining a flexible annular lip, loosely assembled over and enclosing said knob element, said knob element being rotatable relative to said knob;

said annular lip being out-turned, of conical shape and of such dimension relative to said knob element and of such elasticity as to be force assembled over said knob element and interlocked therewith;



said head having a flat end face at right angles to said bore defining a bearing surface;

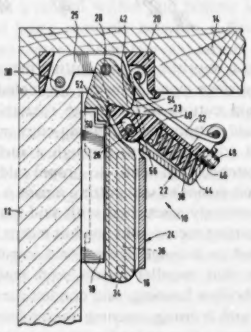
and a sleeve receiving said shaft projecting laterally from said end face coaxial of said bore and adapted for extension through a wall panel, said bearing surface adapted to cooperatively engage said wall panel;

and a neck of uniform diameter between said shank other end and knob element, spacing said knob element outwardly of said shank and cooperatively receiving the annular lip of said swivel knob, said different plastic materials providing lubrication between said knob element and swivel knob reducing friction there between.

4,117,569
OVER-CENTER KNUCKLE-JOINT HINGE

Karl Lautenschläger, Jr., and Reinhard Lautenschläger, both of Reinheim, Fed. Rep. of Germany, assignors to Karl Lautenschlager KG, Reinheim, Fed. Rep. of Germany

Filed Nov. 11, 1976, Ser. No. 740,980
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1975, 2552729; Apr. 17, 1976, 2617070
Int. Cl.[2] E05D *11/10*
U.S. Cl. 16—139 **6 Claims**



1. A knuckle-joint over-center hinge adapted to occupy two end positions offset by an angle of from 170° to 180° with respect to each other and a dead-center position, in combination with a first member for connection to a cabinet wall and a

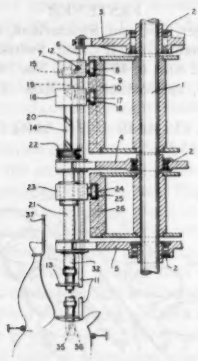
second member for connecting to a cabinet door, comprising: a first arm and a second arm, one end of said first arm being pivotally linked to said first member, and one end of said second arm being pivotally linked to said second member, the other end of said first arm being coupled to said second member so as to be variable as to position along a predetermined spatial curve, the other end of said second arm being coupled to said first member so as to be variable as to position along a predetermined spatial curve, and an over-center mechanism forcing said hinge resiliently towards one of said end positions, said mechanism including a closing spring having a first end disposed and supported at said first arm and a second end, a counter-surface which changes its spatial position relative to said second spring end during the pivoting movement of said hinge from one end position to the other end position such that the spring undergoes a maximum deflection in an intermediate position of said hinge, said first arm having a portion of U-shaped cross-section, and a transverse wall, a pusher displaceably mounted in said first arm, said closing spring being disposed within said portion of U-shaped cross-section and supporting itself with its said first end on said transverse wall, said second end of said spring engaging said pusher, said first member having a cam projection in the vicinity of the point where said first arm is pivotally linked to said first member, said counter-surface being formed on said cam projection, said pusher supporting itself on said counter-surface.

4,117,570

APPARATUS FOR CUTTING OUT THE VENT OF A FOWL

Pieter Meyn, Noordeinde 68, Oostzaan, Netherlands

Filed Jul. 25, 1977, Ser. No. 818,767
Int. Cl.[2] A22B *3/08*; A22C *21/00*
U.S. Cl. 17—11 **9 Claims**



1. In an installation for processing slaughtered poultry, including an overhead conveyor supporting a plurality of shackles, each adapted to carry a fowl by its ankle joints:

apparatus for cutting out the vent of a fowl depending from one of said shackles, comprising:

a frame;

at least one cutting means carried by said frame; and

means connected with said frame for moving said cutting means along with said conveyor and relative thereto towards and away from said fowl;

said cutting means comprising

a hollow cylindrical knife mounted for rotation about a center pin, adapted to be inserted into the fowl's vent opening as said cutting means is moved towards said fowl, for bringing said rotating knife into the right position for cutting out the fowl's vent;

driving means for rotating said knife; and

means for axially moving said rotating knife and said center pin relative to each other;

said cutting means further comprising:

a helical hook within said knife, concentrically surrounding said center pin with some play and rigidly connected therewith; and p2 means for rotating said center pin and said hook about a common axis;

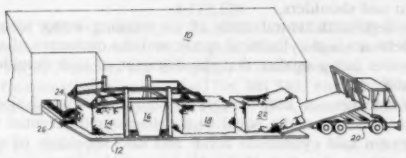
and means for controlling the relative movements of said knife and said center pin in such manner, that said pin while being inserted into the vent opening is rotated together with said hook over a limited angle about said common axis, so that said hook grips the fowl's vent in the manner of a corkscrew, after which the vent is pulled up towards said knife by said hook and is cut out by said knife, and finally said hook is rotated in the opposite direction and freed from the cut out vent.

4,117,571

METHOD OF FEEDING COTTON TO A GIN

Jimmy F. Prather, Rte. 1, Brownfield, Tex. 79316

Filed Feb. 18, 1977, Ser. No. 769,919
Int. Cl.[2] D01G *7/00*
U.S. Cl. 19—64.5 **1 Claim**



1. In the method of feeding seed cotton to a cotton gin, including

a. placing a first rick of seed cotton on a slab and

b. advancing a feeder unit against the first rick of seed cotton, thereby

c. taking the seed cotton from the first rick into a first side of the feeder unit and feeding it to the gin; the improvement comprising the following steps:

d. placing a second rick of seed cotton on the slab on the opposite side of the feeder unit from the first rick,

e. reversing directions of travel of the feeder unit after the first rick is finished feeding into the gin, and

f. advancing the feeder unit against the second rick thereby engaging the opposite side of said feeder unit with said second rick,

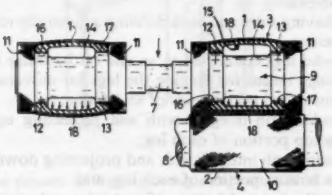
g. taking the seed cotton from the second rick into said opposite side of the feeder unit and feeding it to the gin.

4,117,572

DRAWING FRAME WITH A BELT CONTROL SYSTEM, FOR SPINNING FRAMES

Goffredo Fusaroli, Milan, Italy, assignor to S.A.M.P.R.E. S.p.A., Milan, Italy

Filed Nov. 17, 1976, Ser. No. 742,434
Claims priority, application Italy, Nov. 28, 1975, 29817 A/75
Int. Cl.[2] D01H *5/86*
U.S. Cl. 19—244 **1 Claim**



1. A drawing frame with a belt control system for spinning frames comprising a couple of feeding cylinders, a couple of

drawing cylinders and, arranged between said couples of cylinders, a control system composed of two superposed belts each passed over one of a pair of further, vertically spaced cylinders and an associated tightening member, the cylinder for the upper belt comprising

a central axle,

at least one rotary bushing mounted on said axle, said bushing being pressed downwardly toward the lower, driving cylinder of said pair, and having thereon a pair of laterally spaced, circumferential shoulders of equal diameter projecting radially outwardly and coaxially relative to a central depressed zone thereof, and

a hollow sleeve of an elastomeric material mounted on said bushing and surrounding the depressed area thereof and having a barrel-like shape and an axial bore with a diameter at its centre which is greater than the diameter of said bore at the ends of the sleeve, whereby said sleeve has enlarged borders of similar configuration at opposite ends thereof,

said barrel-shaped sleeve being mounted between, and laterally retained by, the two shoulders of the bushing and having its enlarged borders seated on spaced, cylindrical zones of equal diameter formed on said bushing adjacent to said shoulders,

the depressed central zone of the bushing being located between said cylindrical zones, and the diameters of said zones being smaller that the diameter of said shoulders, and

the thickness of said borders of the barrel-shaped sleeve being substantially equal to the diameter differential between said cylindrical zones and said shoulders of said bushing, whereby said shoulders on said bushing are maintained in drive transmitting relationship with said lower, driving cylinder of said pair, and

said shoulders on said bushing operatively clamping said borders against lateral expansion on said cylindrical zones, whereby during use passage of a fiber tow between said pair of cylinders will cause said sleeve to curve inwardly only at its central portion into said depressed zone of said bushing.

4,117,573

PACKING BAND TIGHTENING DEVICE

Minoru Nakamura, Osaka, Japan, assignor to Idemitsu Lion Co., Ltd., Ichihara, Japan

Filed Aug. 4, 1977, Ser. No. 821,812
Int. Cl.[2] A44B *11/00, 11/02*
U.S. Cl. 24—74 A **9 Claims**

1. A band tightening device wholly of synthetic resin material and comprising

a frame having sides and ends defining a generally rectangular opening;

two parallel legs connected to an end of the frame by integral hinge means for hinging the legs for movement to a position seated on the ends of said frame;

a longitudinal rib integral with and projecting upwardly from a top portion of each leg;

a longitudinal rib integral with and projecting downwardly from a bottom portion of each leg; and

ridges on the top and bottom of said sides and extending in the direction of said legs;

said ribs engaging a synthetic material packing band extending around said legs and under said sides of the frame to grip said bands without danger of cutting the material of the band, and reinforcing said legs to resist deformation under the action of the band; and wherein

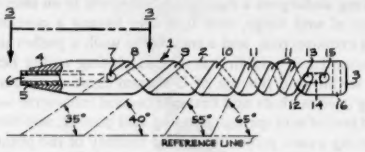
said ribs of each leg have a length less than the length of said rectangular opening, and said legs, in said seated position on the frame, each have a rib extending into the frame opening.

4,117,574

KNOTLESS FISH LINE CONNECTOR

William Goro Yoshida, 47-197 Iuiu St., Kaneohe, Hi. 96744

Filed Mar. 31, 1978, Ser. No. 892,078
Int. Cl.[2] F16G *11/00;* **A01K** *91/04*
U.S. Cl. 24—129 R **10 Claims**



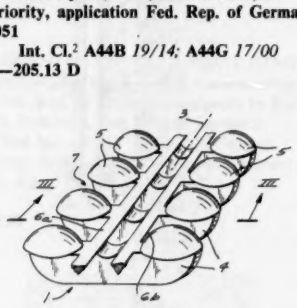
1. A knotless fish line connector comprising a shaft with a cylindrical opening at one end and a leader opening at the other end, at the end of the cylindrical opening are spiral grooves in the surface of the shaft, at the end of the last spiral groove is at least one locking groove in the surface of the shaft, at the end of the last locking groove are at least two locking holes in the shaft.

4,117,575

FASTENER

Helmut Heimberger, Locarno, Switzerland, assignor to Optilon W. Erich Heilmann GmbH, Cham, Switzerland

Filed Apr. 6, 1977, Ser. No. 785,167
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2615051
Int. Cl.[2] A44B *19/14;* **A44G** *17/00*
U.S. Cl. 24—205.13 D **7 Claims**



1. A fastener comprising:

a pair of interdigitable coupling elements, each of said coupling elements having a multiplicity of carrier members extending transverse to its axis and in mutually spaced relation therealong;

a respective coupling head on each of said carriers, said coupling heads defining inter-head spaces for receiving the heads of the other coupling element between them; and

a pair of connecting strands unitary with the coupling element extending along each of said coupling elements in transversely spaced parallel relation, said strands forming flexible ligatures interconnecting the successive carriers and forming abutments limiting lateral displacement of said coupling elements upon the interdigitation of the heads thereof, each of said carriers being formed with a pair of such heads, the heads of each coupling element

forming two rows, said strands lying inwardly of said rows.

4,117,576

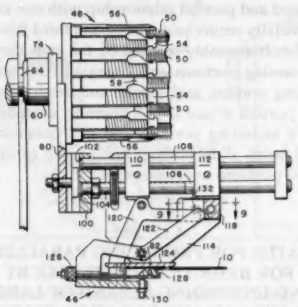
SELVEDGE DETECTOR AND GUIDE

Walter Engels, Tryon, N.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 713,394, Aug. 11, 1976, Pat. No. 4,054,974. This application Feb. 14, 1977, Ser. No. 768,060

Int. Cl.[2] D06C *13/08*

U.S. Cl. 26—9 **1 Claim**



1. Apparatus to perform a function on a web of fabric having a raised surface and a selvedge comprising a control means, said control means including a fluidic sensing device operably associated with said apparatus and mounted thereon, said fluidic sensing device including a first conduit being supplied with air under pressure and a second conduit receiving air under pressure from said first conduit, a pair of flag members, means pivotally mounting said flag members between said first conduit and said second conduit, means biassing said flag members to a predetermined position between said conduits to permit a selected portion of the air under pressure to pass from the first conduit to the second conduit to maintain the apparatus in a normal operating position, said flag members being responsive to variations in selvedge width to alter the selected air portion received by said second conduit, one of the flag members being biassed from the predetermined position by engagement with a selvedge greater than a predetermined width and the other of the flag members being biassed from the predetermined position by engagement with the raised surface when the selvedge is less than the predetermined width and means responsive to such air alterations to actuate the control means accordingly.

4,117,577

METHOD TO PROTECT FABRIC SELVEDGE ON LOOP PILE CUTTING MACHINE

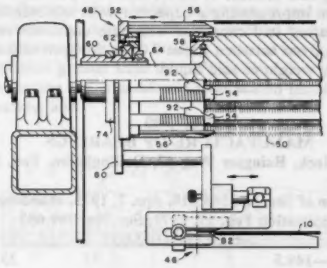
Michael William Gilpatrick, Chesnee, S.C., and Walter Engels, Tryon, N.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 714,100, Aug. 13, 1976, Pat. No. 4,069,561. This application Jun. 20, 1977, Ser. No. 808,094

Int. Cl.[2] D06C *13/08*

U.S. Cl. 26—9 **1 Claim**

1. The method of providing a cut loop pile fabric on a machine having a rotor across which is mounted a plurality of rows of cutting blades comprising the steps of: supplying a web of loop pile fabric having a selvedge area, rotating the rotor, passing the web of loop pile fabric over the rotor with the main body of the loop pile fabric in contact with the cutting blades while providing means to hold the selvedge away from the cutting blades, cutting the loops in the main body of the loop pile fabric while sensing the position of the selvedge to automatically position the means to maintain the selvedge away from the cutting blades and taking up the cut loop pile fabric.



4,117,578

PROCESS FOR HEAT TREATING A NEEDLED BATT

Herman Hans Forsten, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 681,580, Apr. 29, 1976, abandoned. This application Apr. 5, 1977, Ser. No. 784,826

Int. Cl.[2] D04H *1/46, 1/50, 5/02*

U.S. Cl. 28—112 **7 Claims**

1. Process for preparing a needled, dimensionally stable, scrimless felt comprising the steps of (1) preparing a batt containing at least 80% by weight drawn, amorphous poly(m-phenylene isophthalamide) staple fibers having a length of 4 to 16 cm. and a shrinkage of at least 10% at 285°–300° C, (2) needling the batt on a needle loom to the extent of 150 to 1000 needle penetrations/cm^2 and (3) treating the needled batt while the batt is under lateral and longitudinal restraint sufficient to prevent more than 10% lateral or longitudinal shrinkage of the batt under conditions such that the unrestrained shrinkage of the fibers would be at least 10%.

4,117,579

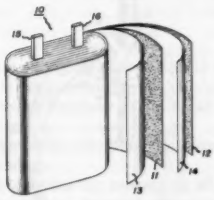
METHOD OF IMPREGNATING A CAPACITOR

David G. Shaw, Glens Falls, and Vandos Shedigian, Hudson Falls, both of N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Continuation of Ser. No. 691,886, Jun. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 597,694, Jul. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 403,787, Oct. 5, 1973, abandoned. This application Jul. 20, 1977, Ser. No. 817,145

Int. Cl.[2] H01G *4/22*

U.S. Cl. 29—25.42 **6 Claims**



1. The process of impregnating a capacitor with an aromatic dielectric liquid comprising

a. mixing with said liquid an antioxidant in an amount of greater than about 0.01% and up to about 10.0% by weight of said liquid.

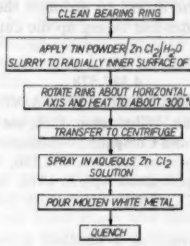
b. refining the mixture including passing the mixture through a filtering process to remove impurities but to retain some antioxidant therein.
c. heating said mixture to an elevated temperature.
d. vacuum impregnating a capacitor with said mixture.
e. and sealing said capacitor with said capacitor retaining therein from between about 0.01 to 5.0% of said antioxidant by weight of said liquid.

4,117,580

MANUFACTURE OF BEARINGS

Friedrich Heck, Baingser Weg 47, Deilinghofen, Fed. Rep. of Germany

Continuation of Ser. No. 565,618, Apr. 7, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,652
Int. Cl.[2] B21D *53/10*
U.S. Cl. 29—149.5 **23 Claims**


CLEAN BEARING RING
APPLY TIN POWDER/ $Zn\,Cl_2/H_2O$ SLURRY TO RADIALLY INNER SURFACE OF RING
ROTATE RING ABOUT HORIZONTAL AXIS AND HEAT TO ABOUT 300°C
TRANSFER TO CENTRIFUGE
SPRAY IN AQUEOUS $Zn\,Cl_2$ SOLUTION
POUR MOLTEN WHITE METAL
QUENCH

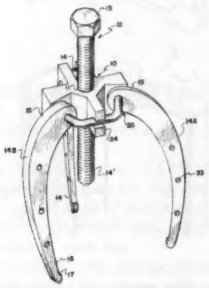
1. In a method of making a lined bearing which comprises applying a layer of metallic bonding material selected from tin and tin alloys to the radially inner surface of a bearing ring and centrifugally casting on a layer of a lining material, the improvement which comprises supplying the bonding material in the form of a powder as a slurry with water and a flux at the radially inner surface of the bearing ring, heating the ring to at least a tinning temperature, being a temperature sufficient to cause conversion of water to steam, applying a flux/water mixture to the thus applied layer of bonding material on the radially inner surface of the hot bearing ring and, without intermediate cooling, centrifugally casting on the layer of lining material.

4,117,581

MULTI-PURPOSE PULLER

Michael Brodie, P.O. Box 64, Vilna, Canada (T0A 3L0)

Filed Jul. 14, 1977, Ser. No. 815,588
Int. Cl.[2] B23P *17/04*
U.S. Cl. 29—261 **10 Claims**



1. A puller selectively usable as a two-jaw puller, a three-jaw puller, an internal puller and an external puller and comprising in combination a head, a pressure bolt screw threadably engageable through said head, a first jaw pivotally secured by one end thereof to one side of said head, a second and third jaw, means pivotally securing said second and third jaws by one end thereof, to said head spaced from said first jaw, a primary mounting portion formed on said head for said second jaw, a further primary mounting portion formed on said head for said third jaw, a common mounting portion formed on said head between said primary mounting portions, article engaging hooks on the other ends of all of said jaws, and means to position said second and third jaws in either of two positions relative to said first jaw, one position being whereby said three jaws are substantially at 120° from one another, and the other position being whereby said second and third jaws are in side by side, spaced and parallel relationship with one another, said means to pivotally secure said second and third jaws taking the form of a U-bolt assembly secured by the ends thereof to said primary mounting portions and engaging through said common mounting portion, said second and third jaws being pivoted on the portion of said U-bolt assembly extending between said primary mounting portions and said common mounting portion and being slidable from one of said positions to the other of said positions and vice-versa.

4,117,582

APPARATUS FOR PRODUCING PARALLEL WIRE STRANDS FOR BRIDGES AND THE LIKE BY WINDING AND UNWINDING STRAND OF LARGE CROSS-SECTION AND FOR SIMULTANEOUSLY APPLYING CORROSION PROTECTION THERETO

Wolfgang Borelly, Schwanenstr. 2C, 68 Mannheim 51, Fed. Rep. of Germany

Division of Ser. No. 439,742, Feb. 5, 1974, Pat. No. 3,919,762, and a continuation-in-part of Ser. No. 385,683, Aug. 6, 1973, abandoned. This application Nov. 12, 1975, Ser. No. 631,322
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1972, 2238714; Jan. 9, 1974, 2400886; Nov. 15, 1973, 2357006
Int. Cl.[2] B23P *11/02*
U.S. Cl. 29—419 R **17 Claims**

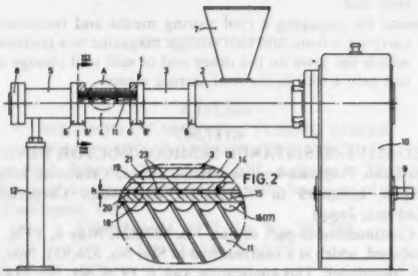
1. A process for winding upon a base of a cable drum for transport or storage a parallel wire strand made up of a plurality of tightly adjacent vertically and horizontally arranged parallel wires, the strand including at least a leading end fitting securing the ends of the wires together, comprising the steps of:

(a) mounting the drum for rotation about a winding axis;
(b) fanning out and rearranging the strand wires rearwardly of the leading end fitting to form at least one flat layer of parallel individual wires disposed in a single plane extending generally parallel with the drum winding axis;
(c) clamping together the leading end portions of the wires at a point forwardly of the fanning out and rearranging location independently and rearwardly of the end fitting where the wires are in flat layer form while the wires are equally tensioned between the clamping location and a point on the strand located rearwardly of the fanning out and rearranging location, and attaching the wires to the cable drum at the point whe. they are clamped together; and
(d) winding the wires in flat layers about the drum base by rotating the drum about its winding axis, whereby the wires are drawn into the drum in flat layers under equal tension and without relative sliding between the wires in the strand.

4,117,583
METHOD OF PROVIDING A WEAR-RESISTANT LINING IN THE WORK CHAMBER OF A SCREW EXTRUDER

Gerhard Gnädig, Ditzingen, and Wilhelm Seufert, Korntal, both of Germany, assignors to Werner & Pfleiderer, Stuttgart, Germany

Filed Dec. 15, 1976, Ser. No. 750,705
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558611
Int. Cl.² B23P *11/02*
U.S. Cl. 29—447 **11 Claims**



1. A method for providing a wear-resistant lining for a work chamber of a screw extruder having a wearing barrel of non-circular external cross-section attached in a thermally conductive manner to the extruder housing, the internal cross-section of the screw extruder housing being of corresponding non-circular cross-section but slightly larger than the external cross-section of the wearing barrel so to define an interstice having a given gap width, comprising:

adding mineral and/or metallic particles as additives to a soft material which is to subsequently become hard, at least some of said particles having a granulometry substantially equal to said gap width and none of said particles having a granulometry greater than said gap width;

applying a layer of said soft material, which subsequently becomes hard with said mineral and/or metallic particles therein onto the external surface of the wearing barrel, said layer having a thickness which is greater than said gap width of said interstice between the external wall of said wearing barrel and the internal wall of said extruder housing;

heating said extruder housing to an extent sufficient to sufficiently enlarge the interior of said extruder housing to allow said wearing barrel having said layer of material in soft condition to be inserted therein; and

inserting said wearing barrel having said layer of material in soft condition hereon into the heater enlarged said extruder housing.

4,117,584
METHOD OF MANUFACTURING AN IMPROVED CONDUIT FOR CONVEYANCE OF HOT FLUID

Pierre Lagarde, Versailles, and Gaston Denoor, Grenoble, both of France, assignors to Metalimphy & B.V.S., Paris, France

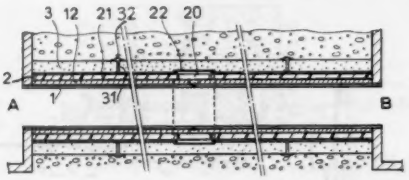
Filed Apr. 6, 1977, Ser. No. 785,214
Claims priority, application France, Apr. 13, 1976, 76 10760
Int. Cl.² B21D *39/00*
U.S. Cl. 29—452 **2 Claims**

1. In a method of manufacturing a conduit for conveying a fluid at a temperature and pressure substantially higher than ambient temperature and pressure, said conduit comprising an inner tube of a material having a low thermal expansion and surrounded by thermal insulation, said tube having a high working temperature when conveying said fluid, the improvement comprising the steps of:

(a) forming said inner tube without expansioncompensating means;

(b) applying about said inner tube, at an installation temperature lower than said working temperature, a wrapping of a binding material whereby expansion of said inner tube in response to said fluid pressure is resisted by binding force of said wrapping, said binding material having a thermal expansion greater than that of said inner tube;

(c) anchoring the ends of said tube at said installation temperature; and

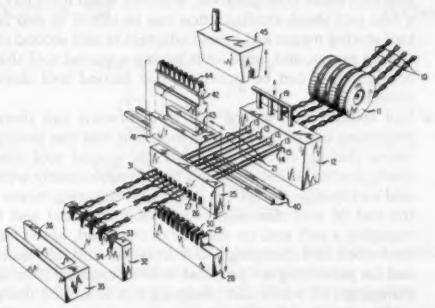


(d) prestressing said wrapping at said installation temperature whereby to compensate the reduction in said binding force at said working temperature resulting from the different thermal expansions of said tube and said wrapping, said prestressing producing elastic elongation of said inner tube, whereby at least in part of compensate compressive stress in said inner tube at said working temperature resulting from the longitudinal thermal expansion of said anchored inner tube.

4,117,585
APPARATUS FOR WIRING ELECTRICAL CABINETS

Arnold Ray Smith, Chester, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 31, 1977, Ser. No. 801,587
Int. Cl.² H01R *43/00, 43/04*
U.S. Cl. 29—566.3 **13 Claims**



1. Apparatus for wiring electrical cabinets with a plurality of twisted pairs of wires comprising: p1 pair-indexing means for selectively presenting members of each said twisted pair in a preselected orientation;

means for temporarily extending the orientation of each of said pair members;

mass-terminating means for connecting all of said extended pair members to an electrical connector block and for forming ends of said pairs; and

means for holding said connector block at a position substantially displaced from said extending means for defining therebetween a substantial length of said twisted pairs in a predetermined sequence while said members are oriented in said preselected orientation to permit the one-pair-at-a-

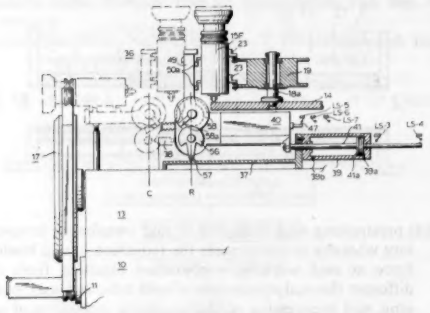
time electrical connection of the ends of said pairs away from said connector block.

4,117,586

MACHINE TOOL WITH AUTOMATIC TOOL CHANGER

Yoshiro Uchida; Toshihiko Mizuno; Isao Higuchi; Susumu Imai, and Shyoichiro Usui, all of Abiko, Japan, assignors to Hitachi Seiki Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1976, Ser. No. 675,897
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **4 Claims**



1. A machine tool comprising:

a tool storage magazine having a plurality of first tool storing means with recesses therein with a shape corresponding to a first tool shank configuration for holding tools having a first shank configuration, a plurality of second tool storing means with recesses therein with a shape corresponding to a second tool shank configuration which is larger than the first tool shank configuration, at least one tool adapter having an exterior shape corresponding to the second tool shank configuration and positioned in at least one of said second tool storing means and further having a recess therein with a shape corresponding to the first tool shank configuration, whereby small tools having a first tool shank configuration can be stored in said first tool storing means and in said adapters in said second tool storing means, and large tools having a second tool shank configuration can be stored in said second tool storing means;

a tool spindle with a tool seat in a forward end thereof projecting out of the machine tool, said tool seat having a recess therein corresponding to the second tool shank configuration, a tool clamping rod movable axially within said tool spindle and having a pull stud engaging means on the end of said clamping rod toward said tool seat for engaging a pull stud on the rear of the shank of the large tool when said clamping rod is retracted into said spindle and for permitting the pull stud to be disengaged from said clamping rod when said clamping rod is moved toward said tool seat a first distance, spring means urging said clamping rod in the retracting direction, each of said adapters having a shank holding means movable in the direction of retraction of said clamping rod for holding the shank of a small tool in the adapter and being movable axially toward the forward end of said spindle by movement of said clamping rod toward said tool seat a second distance less than said first distance for releasing the shank of the small tool without releasing said adapter from said tool seat;

an automatic tool changer comprising a rotatable center shaft parallel to said spindle, a tool change arm transversely mounted on the outer end of said center shaft, a pair of tool holding jaws mounted on the opposite ends of said tool change arm and movable from a fully open position to at least an intermediate position in which they can grasp a large tool and to a fully closed position in which they can grasp a small tool, a rotational drive means coupled to said rotatable center shaft for reciprocatably rotating said center shaft around the axis of said center shaft from a position where the jaws on one end of said tool change arm can grasp a tool in the spindle to a position where the jaws on the other end of said tool change arm can grasp a tool in said spindle, an axial drive means coupled to said center shaft for driving said center shaft axially, and jaw driving means coupled to said jaws for driving said jaws to close said jaws to said intermediate or fully closed positions depending on the size of the tool to be grasped and to return the jaws to the fully open position; and

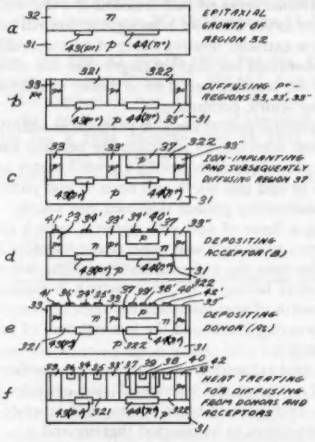
means for engaging a tool storing means and reciprocally carrying it from said tool storage magazine to a position at which the jaws on the other end of said tool change arm can grip a tool in the tool storing means.

4,117,587

NEGATIVE-RESISTANCE SEMICONDUCTOR DEVICE

Gota Kano, Nagaoka-kyo, and Hitoo Iwasa, Takatsuki, both of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Continuation-in-part of Ser. No. 683,824, May 6, 1976, abandoned, which is a continuation of Ser. No. 526,931, Nov. 25, 1974, abandoned. This application Aug. 6, 1976, Ser. No. 712,583
Claims priority, application Japan, Nov. 30, 1973, 48-135552
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **4 Claims**



1. A method of making negative-resistance semiconductor devices of the type comprising two complimentary depletion type junction field effect transistors (FETs) interconnected together and the respective gates of said FETs are connected to the drain of the other FET, the method comprising the step of:

forming diffused separation regions in an epitaxial region of a first conductivity type formed on a substrate of a second conductivity type, in a maner such that said diffused separation regions penetrate and hence divide said epitaxial region to form at least two islands which are isolated from each other by p-n junctions,

forming a diffused well region of said second conductivity type in one of said islands,

depositing shaped members of high concentration donor and of high concentration acceptor on specified portions of surfaces of the other one of said island regions and of said diffused well region, said specified portions being relatively disposed corresponding to the respective gates, drains and sources of said FETs,

heat treating for simultaneously diffusing from said members of high concentration donor and said members of high concentration acceptor to form n^+-regions and p^+-regions, respectively, and thereby the gate, source and drain regions of said FETs,

forming contact electrodes to said gate, drain and source regions; and

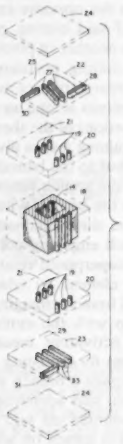
forming electrical connections between the respective source regions of said FETs and between the respective gate regions of each FET to the drain region of the other FET.

4,117,588

METHOD OF MANUFACTURING THREE DIMENSIONAL INTEGRATED CIRCUITS

Leopold J. Johnson, Escondido, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1977, Ser. No. 761,749
Int. Cl.[2] H01F *41/02*
U.S. Cl. 29—608 **5 Claims**



1. A method of manufacturing three-dimensional integrated circuit elements from compatible co-fireable materials the steps of:

(a) selecting a number of different compatible co-fireable materials from a group in accordance with a specific electrical requirement;

(b) batching together selected groups of the compatible co-fireable materials with a suitable binder to form a plurality of different discrete composite materials in a condition suitable for extrusion;

(c) extruding said discrete composite materials together in predetermined patterns to form extruded blocks having uniform cross-section throughout the entire length of the block,

(d) stacking a plurality of sections, said plurality of sections having at least one section of specified width from a plurality of different extruded blocks and being in registry such that patterns on different sections are superposed in a desired circuit pattern,

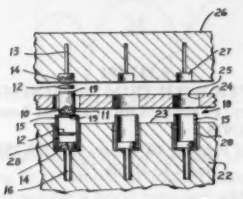
(e) applying temperature and pressure to said stacked sections in a furnace according to a predetermined temperature-time profile.

4,117,589

METHOD OF MANUFACTURING A HERMETICALLY SEALED ELECTRONIC COMPONENT

Gaylord Lee Francis, Califon, and Amedeo John Morelli, Randolph, both of N.J., assignors to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 616,651, Sep. 25, 1975, Pat. No. 4,016,527. This application Mar. 3, 1977, Ser. No. 774,136
Int. Cl.[2] H01C *17/28*
U.S. Cl. 29—61^ **14 Claims**



1. A method of manufacturing a hermetically sealed component comprising the steps of:

placing a bottle having an attached first terminal on a closed end in a cavity in a boat;

inserting a first solderable preform in said bottle in said boat;

thereafter introducing a passive electrical core element having ends coated with refractory metal in said bottle;

thereafter introducing a second solderable preform in said bottle;

thereafter introducing a second terminal into said bottle; and

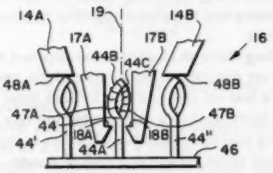
sealing said bottle by applying heat to said bottle around said second terminal.

4,117,590

WIRE LEAD AND SOLDER REMOVAL TOOL

Willard Emanuel Rapp, Princeton, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 7, 1977, Ser. No. 840,429
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—764 **21 Claims**



1. A tool for removing at least one wire lead from a terminal with a plurality of surfaces, the tool comprising:

a plurality of scrapers, each including a scraping edge;

means, so mounting said plurality of scrapers that each scraping edge faces a scraping edge of an associated scraper, for moving said plurality of scrapers linearly between an extended position and a withdrawn position thereof;

means, urging said facing scraping edges of said plurality of scrapers apart, and responsive to said plurality of scrapers moving into said extended position thereof, for separating said facing scraping edges of said scrapers, such that the plurality of scrapers may readily be positioned axially along the terminal beyond at least one wire lead thereon; and

means, urging said facing scraping edges of said plurality of scrapers toward one another, and responsive to said plurality of scrapers moving away from said extended position thereof, for so displacing said facing scraping edges toward one another as to engage said scraping edges

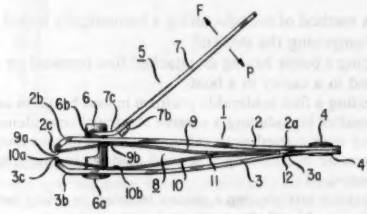
firmly with said plurality of surfaces of the terminal upon axial movement of said plurality of scrapers toward said withdrawn position thereof during operation of said moving means, thereby scraping the wire lead or leads axially off the terminal.

4,117,591

NAIL CLIPPER WITH TRIM RETAINING CLAMP

Catherine S. Terry, 1 Falmouth Rd., Chatham Township, Morris County, N.J. 07928

Filed Feb. 22, 1977, Ser. No. 770,703
Int. Cl.[2] B26B *17/02*
U.S. Cl. 30—124 **5 Claims**



1. In combination with a nail clipping device having

a dual set of elongated spring arms of a first resilient material, said spring arms constructed and arranged in superimposed relation with one of their ends fixedly joined together to form a fixed juncture including an arm cantilever point, the free ends of said spring arms opposite said fixed juncture disposed to diverge from said arm cantilever point and be normally spaced-apart due to the resiliency of said first material, said free ends having transversely extending, inwardly directed lips with cutting edges constructed to project together in cooperative cutting relation,

a pin extending through aligned holes disposed near said free ends, a lever pivotally attached to said pin, said pin held in place by a seat on one end and by said lever at the other end, said lever having a cam contacting one of said arms for moving said lips towards each other in cutting relation to a portion of an interjected nail of a user:

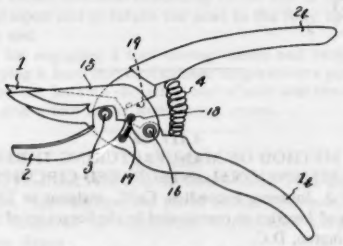
means for clamping said nail portion, said clamping means formed from a pair of superposed, elongated blades of a second resilient material and disposed between said spring arms, each said blade having an opening constructed to straddle said pin, said blades fastened together at one of their ends to form a fixed juncture including a blade cantilever point, said blades disposed to diverge from said blade cantilever point towards said free ends of said spring arms, said blades having their forward ends normally spaced-apart by the spring action of said second resilient material, said forward ends of said blades being bent towards one another from oppositely directed vertices, said blades constrained by contact of said vertices with the inner surfaces of said spring arms, said free ends of said blades projecting laterally to define jaws constructed to cooperatively engage the interjected nail of the user prior to and during cutting in response to operation of said lever to close said blades, and said blades responsive to a reduction of pressure exerted on said lever to release said nail trimming for proper discarding.

4,117,592

GARDEN SHEARS

Eizo Mori, and Takao Mori, both of 11 of 473-banchi, Oaza Kuzuha, Hirakata-shi, Osaka-fu, Japan

Continuation-in-part of Ser. No. 645,659, Dec. 31, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,197
Claims priority, application Japan, Jan. 7, 1975, 50-4725; Apr. 30, 1975, 50-53022
Int. Cl.[2] B26B *13/14*
U.S. Cl. 30—135 **1 Claim**



1. A pair of garden shears comprising a pair of elongated shear elements having complementary cutting portions at the forward end of each and having gripping means for actuating the shear elements at the opposite ends thereof, pivot means spaced rearwardly of said cutting portions connecting said shear elements to one another in pivotal relationship for opening and closing the cutting portions of the shear elements, spring means spaced rearwardly of said pivot means and connecting the shear elements to one another under compression to keep the cutting portions of the shear elements in a normally open state, branch retaining means pivotally mounted adjacent its rearward end thereof to the lateral face of one of the shear elements with which the branch retaining means will not be in cooperation to retain the branch when cut and rearwardly of the pivot point of the shear elements, said branch retaining means having a branch engaging portion at the forward end thereof and lying in superposed relationship with the cutting portion of the shear element to which the branch retaining means is pivoted, said branch engaging means being in aligned operating relationship with the cutting portion of the other shear element, and activating means associated with said branch engaging means for actuating same in association with a shear element to engage a branch to be cut prior to cutting through of the branch, said actuating means comprising projection pin means mounted on said branch retaining means rearwardly of the pivot means on which said shear elements are mounted and forwardly of the point at which said branch retaining means are pivotally mounted to a shear element, said projection pin means being in cooperative relationship with a portion of the inner side edge of the shear element to which said branch retaining means is not mounted to rotate the branch retaining means into strong engagement with the branch to be cut.

4,117,593

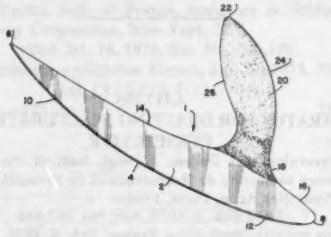
KNIFE

Dimi Piligrino, 2152 Maha Pl., Honolulu, Hi. 96819

Filed May 17, 1977, Ser. No. 797,836
Int. Cl.[2] B26B *3/03, 9/02*
U.S. Cl. 30—314 **12 Claims**

1. A knife comprising a blade having a convex curved lower elongated cutting edge terminating forwardly and rearwardly respectively in a forward sharp end and a rearward sharp end and having at least one of the ends pointed, the blade having an upper surface opposite the cutting edges between the forward and rearward ends, and a continuously uniformly curving stem extending upwardly from an upper surface of the blade at a position from the forward to the rearward ends, a handle connected to the stem, and continuously uniformly curving

with the stem and extending outward therefrom away from the blade and wherein the handle has an elongated upper convex



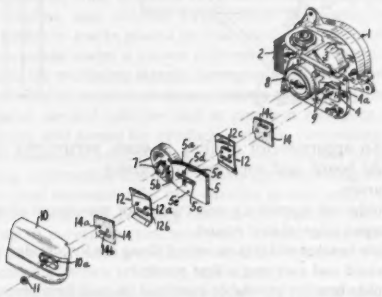
curve opposite to the convex curve of the cutting edge of the blade in a plane of the blade.

4,117,594

GUIDE BAR MOUNT FOR CHAIN SAW

James A. Arbuckle, Omro, Wis., assignor to Textron Inc., Providence, R.I.

Filed Oct. 2, 1977, Ser. No. 843,954
Int. Cl.[2] B27B *17/02*
U.S. Cl. 30—381 **7 Claims**



1. In a chain saw comprising a powerhead with a case having a support surface for mounting a guide bar thereon, a guide bar having an apertured rear end portion for mounting on said support surface, a cover for the rear end portion of said guide bar, and bolt means for securing said cover to said motor case with the rear end portion of said guide bar therebetween, said bolt means passing through an aperture in said guide bar, the improvement which comprises interposing a pad of vibration damping material between said guide bar and said support surface of said motor case and a pad of vibration damping material between said guide bar and said cover, whereby said guide bar is gripped between said pads of vibration damping material and is thereby vibration-isolated from said powerhead case.

4,117,595

METHOD FOR REPAIR OF PORCELAIN DENTAL PROSTHESES

Robert L. Ibsen, and William Richard Glace, both of Santa Maria, Calif., assignors to Den-Mat, Inc., Santa Maria, Calif.

Filed Apr. 15, 1977, Ser. No. 787,754
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—8 **7 Claims**

1. A method of repairing in situ a damaged dental porcelain prosthesis on a suitable base:

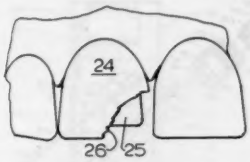
(a) mechanically removing all plaque adjacent the damaged site,

(b) mechanically removing all friable porcelain at the damaged site,

(c) washing the damaged site with a priming agent consisting essentially of an aqueous solution of a weak acid,

(d) removing said agent with a water wash and drying said site,

(e) applying to the damaged site a bonding agent to adhere a



restorative material to said base and to said porcelain and allowing to remain for at least 20 seconds,

(f) mixing together a liquid resin and white powder in such amounts that the resulting mixture is wet and just barely too thick to flow,

(g) applying said mixture of resin and powder to at least fill the damaged site and allow to set and harden, and

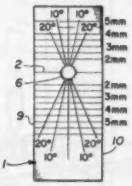
(h) finishing the surface of the filled site.

4,117,596

APPARATUS AND METHOD FOR MOUNTING ORTHODONTIC APPLIANCES TO TEETH

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214

Filed Jul. 6, 1977, Ser. No. 813,337
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 R **35 Claims**



1. Apparatus for mounting an orthodontic appliance on a tooth comprising:

an adhesive member which is adapted to be temporarily adhered to a surface of a tooth;

said adhesive member including means for mounting an orthodontic appliance thereon in a given orientation relative to said adhesive member; and

said adhesive member further including means for measuring and indicating an orientation of said orthodontic appliance relative to at least one of said adhesive member and a tooth.

4,117,597

DENTAL DRILL

Nicolas P. Trist, Calabasas; Robert E. Guffin, La Habra; Walter M. Franklin, Sunland; James B. Crosby, Jr., North Hollywood; Glen N. Hallaway, Saugus, and James G. Tellier, Canoga Park, all of Calif., assignors to L.A. Gauge Co. Inc., Sun Valley, Calif.

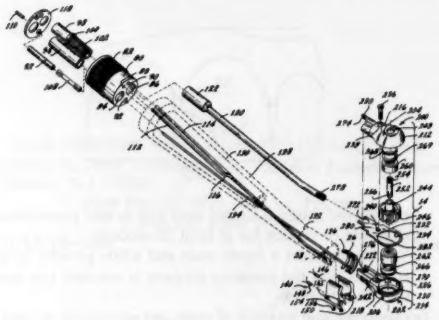
Filed Jul. 30, 1976, Ser. No. 710,198
Int. Cl.[2] A61C *1/10*
U.S. Cl. 32—27 **27 Claims**

1. An air-operated dental drill, including

an elongated handle including means at one end for connection to a tubing connector, and including an elongated tube extending from the means at one end to the other end

of the elongated handle for providing a passage of air from one end of the handle to the other end of the handle,

a head member supported at the other end of the handle and including an air turbine motor located within the head member for receiving the air passed to the other end of the handle, and



the outer housing of the head member formed from a pair of complementary hollow members each mounted on opposite sides of a divider plate to accurately align and lock the pair of hollow members relative to each other.

4,117,598

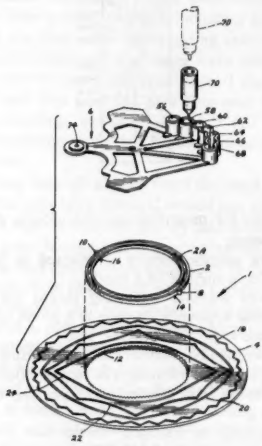
DRAWING INSTRUMENT OR APPARATUS

Denys Fisher, Kirkconnel Lea, Glencaple, Dumfries, Scotland

Filed Oct. 17, 1977, Ser. No. 842,657

Int. Cl.[2] B43L *11/00, 9/00*

U.S. Cl. 33—27 L **24 Claims**



1. A design drawing instrument comprising a primary member, said primary member including a ring and at least one guide plate which interfits together with said ring, the top surface of said ring having a groove therein, said guide plate having one or more guide paths, a secondary member which is movable relative to said primary member by the engagement of two spigots with said one or more guide paths, one of said spigots being attached to the undersurface of said secondary member, said groove adapted to receive said one spigot, one of said members having one or more holes or apertures through which may project the tip or point of a writing, drawing, or scribing instrument such that a design or drawing is produced on the other of said members, when said primary and secondary members are moved relative to each other.

4,117,599

APPARATUS FOR DRAFTING INACCURATE CONIC PERSPECTIVE

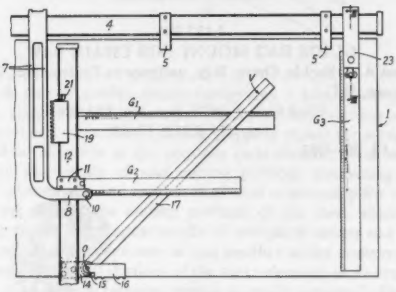
Jean Tavernier, and Eugene Henaut, both of Paris, France, assignors to Societe de Recherches et de Promotion d'Activities Nouvelles Acno, Paris, France

Filed Feb. 2, 1977, Ser. No. 765,016

Claims priority, application France, Feb. 6, 1976, 76 03349

Int. Cl.[2] B43L *13/14*

U.S. Cl. 33—77 **1 Claim**



1. An apparatus for drafting in conic perspective over a drawing board, said apparatus comprising:

a cursor,

a guide rail supporting said cursor for movement along the upper edge of said board;

a slide bracket slidably mounted along the lower edge of said board and carrying a first pivot;

a guide bracket pivotably mounted on said first pivot;

a guide member slidably mounted in said guide bracket, a support bracket secured to said guide member and carrying a second pivot, and a slide member having a slot therealong for slidably receiving therein said guide member, said slide member being slidable along said guide member over said support bracket;

an arm having an upper end coupled to for movement with said cursor, an intermediate portion parallel to and spaced from the plane of said board, and a lower end laterally offset from said intermediate portion, said lower end being pivotably mounted on said second pivot, whereby the axis of said intermediate portion is parallel to a line passing through said first and second pivots;

a transparent ruler carrying a datum line, said ruler being pivotably mounted about said first pivot, said datum line passing through the axes of said first and second pivots when said ruler is in its rest position;

a first transparent graduated scale mounted on said slide member, said first scale being parallel to the plane of said board and lying under said ruler, a second transparent graduated scale mounted on said support bracket above said ruler, the zero graduations of said first and second scales lying on a line passing through the axes of said first and second pivots;

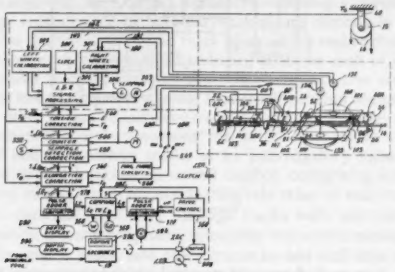
and a third graduated scale coupled to for movement with said cursor, the axis of said third scale being substantially perpendicular to the direction of movement of said cursor, and being laterally spaced from said guide member.

4,117,600

METHOD AND APPARATUS FOR PROVIDING REPEATABLE WIRELINE DEPTH MEASUREMENTS

Jean Guignard, Petit Sainte-Mesme, and Jean-Marie Lorre, Gif-sur-Yvette, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Jul. 16, 1976, Ser. No. 706,105
Claims priority, application France, Jul. 22, 1975, 75 22777
Int. Cl.[2] G01B *3/12, 5/04*
U.S. Cl. 33—133 **26 Claims**



1. Apparatus for providing a repeatable signal representative of movement of a wireline under varying wireline measurement conditions and driving a recorder for depth recording measurements from borehole tools lowered in a borehole on said wireline, said wireline having been previously marked with magnetic marks placed on said wireline at selected intervals measured under a known reference tension, comprising:

means for producing signals corresponding to different types of wireline movement measurements at generally the same point on said wireline and at common reference conditions, said means for producing signals comprising:

first means mechanically coupled to said wireline for providing incremental first type signals corresponding to incremental movement for said wireline at said point;

second means for providig second type signals corresponding to movement past said point of said magnetic marks placed on said wireline at selected intervals measured under a known reference tension; and

tension measurement and tension correcting means for measuring the tension of said wireline during said movement and tension correcting said incremental first type signals to said known reference tension, whereby said second type and tension-corrected first type signals correspond to the same movement of said wireline under ideal measurement conditions; and

means for automatically utilizing said second type signals to start and stop counting said incremental tension-corrected first type signals to obtain a count for an interval between successive second type signals and correcting said tension-corrected first type signals when said count is less than a number corresponding to the number of counts normally expected for said selected intervals to provide a repeatable signal representative of said wireline movement under varying mechanicallly coupled wireline measurement conditions.

4,117,601

LONGITUDINAL MEASURING INSTRUMENT

Hans-Rudolf Kober, and Alfons Ernst, both of Traunreut, Fed. Rep. of Germany, assignors to Firma Dr. Johannes Heidenhain GmbH., Traunreut, Fed. Rep. of Germany

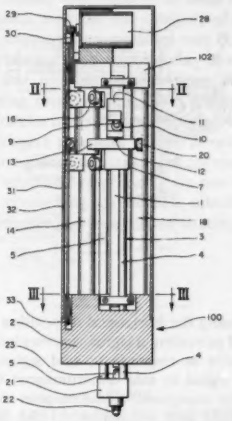
Filed Feb. 7, 1977, Ser. No. 766,389
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605020
Int. Cl.[2] G01B *7/02*
U.S. Cl. 33—172 E **15 Claims**

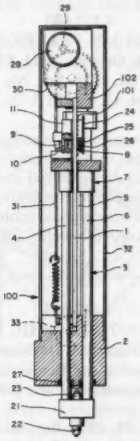
11. An instrument for measuring distances along a path comprising:

a frame member;

a scale mounted to said frame member and having a longitudinal graduation axis;

means for supporting a measuring probe, said probe supporting means mounted on said frame member for displacement parallel to the axis of said scale, and having at least two bars symmetrically positioned parallel to the graduation axis;





means for scanning said scale along the graduation axis, said scanning means mounted to said probe supporting means; and

a measuring probe attached to said bars of said probe supporting means, said bars having a length sufficient to position said measuring probe beyond an end of said scale along a straight-line extension of the longitudinal graduation axis.

4,117,602

ELECTROMAGNETIC COMPASS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Apr. 4, 1977, Ser. No. 784,272
Int. Cl.[2] G01C *17/28*
U.S. Cl. 33—352 **6 Claims**

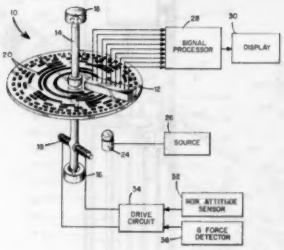
1. A magnetic compass operative to be energized only when

the compass magnet is substantially in a horizontal disposition comprising:

a normally stationary compass disk having indicia thereon representing compass headings;

means supporting said disk for rotation about its normally vertical axis;

an electromagnet affixed to and rotatable with said disk, and being non-energized except when in a horizontal disposition;



means for sensing the horizontal disposition of said electromagnet and providing a signal representative thereof; and

means operative in response to said signal to provide an energizing signal to said electromagnet to permit alignment of the energized electromagnet with the earth's magnetic field and orientation of the compass disk to provide an indication of compass heading.

4,117,603

HIGH VACUUM FREEZE-DRYING

Walton J. Smith, Rte. 4, Grafton, N.H. 03240

Filed Dec. 28, 1976, Ser. No. 755,000

Int. Cl.[2] F26B *5/06*

U.S. Cl. 34—5 **5 Claims**

1. A method of preparing a water-soluble, substantially anhydrous material stable to hydrolysis comprising subjecting a freeze-dried, water-soluble material containing molecularly bound water which is susceptible to hydrolysis to a vacuum of 10 microns or less Hg to remove said molecularly bound water and condensing the removed water on a condenser below −50° C.

4,117,604

DRYER FOR PHOTOGRAPHIC PROCESSORS

John S. Burg, Crystal; Donald M. Davidson, New Hope; Marvin K. McClure, Minneapolis, and Benjamin H. Sannel, St. Louis Pk., all of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Mar. 31, 1977, Ser. No. 783,174

Int. Cl.[2] F26B *19/00*

U.S. Cl. 34—70 **6 Claims**

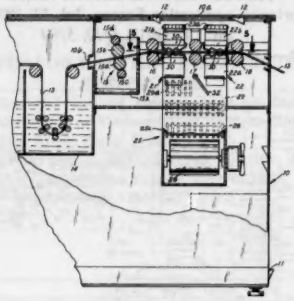
1. A compact dryer unit for drying photographic sheet material being processed, said drying unit comprising:

a housing having a material receiving opening and a material discharge opening and defining a drying chamber having vents for intake and exhaust air therein,

a pair of liquid spreading and removing rollers adjacent the material receiving opening and engaging the surfaces of the photographic sheet to remove and uniformly spread the liquid on the photographic surface of the sheet,

a plurality of rollers and sheet guiding means constructed and arranged to define a transport path extending in substantially straight line relation between the receiving opening and the discharge opening,

at least one pair of opposed spaced apart hollow air distribution manifolds in said drying chamber and respectively mounted on opposite sides of said transport path and having opposed portions said manifolds having air intakes disposed at the same side of the drying chamber and including a plurality of spaced air discharge openings formed in said opposed portions and arranged in such a way to discharge in substantially uniform quantities and velocities drying air against the surface areas on both sides of the sheet material being transported along said transport path from said material receiving opening to said material discharge opening, a single blower remote from said manifold for supplying drying air to said drying chamber and the air intakes of said manifolds, and means for heating the drying air.



4,117,605

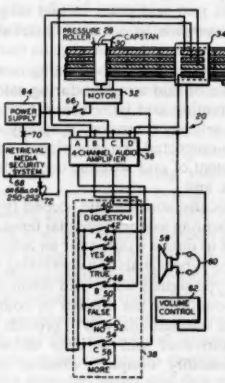
REAL TIME CONVERSATIONAL TOY HAVING SECURE PLAYBACK RESPONSE

Lawrence G. Kurland, Melville, N.Y., and Michael J. Freeman, 12 Maplewood Rd., Hartsdale, N.Y. 10530, assignors to Michael J. Freeman, Hartsdale, N.Y.

Filed Jun. 24, 1976, Ser. No. 699,433

Int. Cl.[2] G09B *7/04*

U.S. Cl. 35—9 A **24 Claims**



1. A real time conversational verbal interactive toy apparatus comprising a removably insertable magnetic storage medium having a housing for said storage medium, said magnetic storage medium comprising a plurality of coextensive multipurpose audio tracks capable of having audio information stored thereon for multipurpose audio playback therefrom; receptacle means for removably receiving said inserted storage medium housing wiith said storage medium in a playback position thereof; audio playback means adjacent said multitrack storage medium and in alignment therewith in said playback position of said received inserted storage medium housing for selectively obtaining said stored audio information from each of said coextensive tracks; multiple choice multipurpose

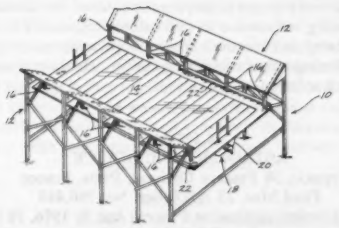
selection means operatively connected to said playback means for directly selecting one of said tracks for reproducing said selected information stored thereon in accordance with a predetermined variable purpose for said multipurpose audio track; and audio output means operatively connected to said playback means and said direct selection means for directly providing said selected track information from said selectively obtained stored audio information for selectively reproducing said information as an audio output therefrom, said information being stored on each track in a plurality of reproducible information segments, each of said segments comprising a complete message reproducible by said playback means directly in response to the selection of said track upon which said segments are stored, each of said information segments on each of said coextensive tracks being spatially related in real time along said tracks and related in content to said information segments on the other of said coextensive tracks in said plurality thereof, said selection means comprising means for designating only one of said coextensive tracks as an interrogatory message track with said information stored thereon comprising interrogatory messages and for designating said other of said coextensive tracks as responsive message tracks with said stored information thereon conprising selectable responsive messages spatially related along said other tracks in said real time and related in content to said interrogatory messages on said one designated interogatory message track dependent on said predetermined purpose for said multipurpose tracks, each of said tracks having substantially the same associated track width, said verbal interactive toy having a timed relationship between adjacent successive interrogatory messages solely dependent on the spatial relationship between said adjacent successive interrogatory messages on said one designated interrogatory message track and said responsive messages on said other tracks whereby said verbal interactive toy apparatus is capable of controlling verbal interaction in real time solely dependent on said spatial relationship, said interrogatory message containing a predetermined category of response thereto, each of said predetermined variable purposes corresponding to a different category of response to said interrogatory messages on said designated interrogatory message track, said multipurpose selection means enabling said category of response to be varied in accordance with a variation in said predetermined category of response contained in said interrogatory message on said designated real time related interrogatory message track; insertion security means operatively associated with said receptacle means for providing an insertion condition for said inserted received multitrack magnetic storage medium housing with respect to said receptacle means, said multitrack storage medium housing having means disposed thereon comprising a playback authorization code for reproduction from said multitrack storage medium, said insertion security means comprising means responsive to said playback authorization code for providing said insertion condition therefrom; and condition responsive means operatively associated with said insertion security means for controllably enabling the provision of said selectable reproduction of said selected information from said multitrack storage medium, said playback means having an enable condition and a disable condition for enabling the provision of said selectable reproduction therefrom only in said enable condition thereof, said condition rsponsive means being responsive to said insertion security means provided insertion condition for providing said enable condition to said playback means only when said provided insertion condition corresponds to a predetermined playback authorization code, whereby only a magnetic storage medium capable of providing said real time conversational type response to an interrogatory message may be employed in said verbal interactive toy apparatus for ensuring secure provision of said real time conversational type response; said multiple choice multipurpose selection means comprising a plurality of switch means, one of said switch means being associated with each of said plurality of audio tracks, at least one of said switch means associated with one of said selectable other designated responsive message tracks comprising a parallel connected switch bank having a plurality of separately operable different single purpose switch members, each of said different single purpose corresponding to a different category of response to an associated real time related interrogatory message, means associated with said switch bank whereby only one of said switch members is operable at a time for said direct selection of said one associated track dependent on said predetermined category of response, said predetermined category of response being defined in said real time related interrogatory message on said interrogatory message track, whereby the category of multiple choice response to said interrogatory messages may be varied and said real time conversational type response may be ensured for each category; said one interrogatory message containing track further comprising associated multiple choice selectable responses to a particular interrogatory message, said other tracks comprising responsive messages related in real time and content to said interrogatory messages and corresponding to said multiple choice selectable responses, only one of said plurality of other tracks comprising the correct selectable responsive message to a particular real time related interrogatory message.

4,117,606

METHOD AND MEANS OF SEQUENTIALLY OBSERVING PLAYER POSITIONS IN PREDETERMINED GAME PLAYS

Richard A. Pundt, 4110 Hickory Hill La., SE., Cedar Rapids, Iowa 52403

Filed Jul. 22, 1977, Ser. No. 818,284
Int. Cl.[2] A63F 7/06
U.S. Cl. 35—29 R **9 Claims**



1. A method of observing sequentially player positions in predetermined game plays, comprising,

selecting a first battery of a plurality of simulated offensive and defensive player positions for an offensive team for an offensive play,

selecting a second battery of a plurality of simulated offensive and defensive player positions for a defensive team to defend said offensive play wherein at least some of the offensive and defensive player positions of said batteries are identical,

providing a plurality of predetermined master play segments utilizing only some of said identical simulated player positions from said offensive and defensive teams wherein said batteries and said master play segments are opaque play sheets with translucent apertures for player positions,

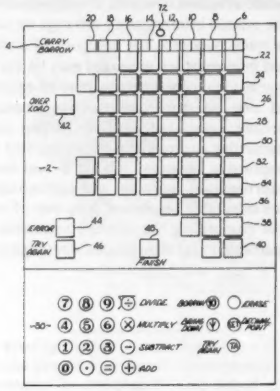
and intermittently and sequentially comparing by superimposing over each other to register the player positions which are common to all three sheets said master play segments in a visual medium with said first and second batteries so that the changing player positions of the offensive and defensive teams throughout the duration of each play can be visually observed.

4,117,607

MATHEMATICS TEACHING SYSTEM

Gary Gill, 1440 E. Sycamore Ave., El Segundo, Calif. 90245

Filed Apr. 11, 1977, Ser. No. 786,291
Int. Cl.[2] G09B *19/02*
U.S. Cl. 35—31 R 34 Claims



1. A mathematics teaching system for use by a student, for performing operations involved in calculation comprising:

entry means operable by said student to enter a mathematics problem and a step-by-step solution of said problem;

calculating means for automatically calculating a correct step-by-step solution to said problem; and

display means, said calculating means providing carry and borrow information to assist the student in performing calculations required in calculating said step-by-step solution of said problem, said display means being responsive to said entry means to display the entered calculation steps and being responsive to said calculating means to display said carry and borrow information to assist said student in performing calculations required in calculating said step-by-step solution.

4,117,608

ASTROLOGICAL DEVICE

Eckhart Trenkle, 38 Passage Choiseul, Paris, France

Filed Mar. 23, 1977, Ser. No. 780,493
Claims priority, application France, Apr. 5, 1976, 76 09797
Int. Cl.[2] G09B *29/00*
U.S. Cl. 35—44 3 Claims

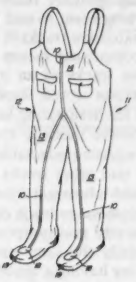
1. An astrological device comprising in combination an endless string of 360 elements of the same thickness, in combination with an astrological board having the 12 signs of the zodiac arranged in an annular series of about the same circumference as the string of elements and with indicia marking the borders between the signs of the zodiac, whereby when the string of elements is superposed on the board, said indicia will delimit 12 groups of 30 said elements, certain of said elements being visibly different from certain others of said elements.

4,117,609

RIP CORD SAFETY DEVICE FOR WADERS

Raymond E. Helt, Pocatello, Id., assignor to Rass, Inc., Pocatello, Id.

Filed Mar. 25, 1977, Ser. No. 781,193
Int. Cl.[2] A43B *1/10*
U.S. Cl. 36—4 6 Claims



1. A rip cord safety device providing a means of opening waders of bib-type to escape therefrom, comprising in combination:

a cord disposed within the walls of each wader boot and extending upwardly from each boot toe to the abdomen area, said cords uniting in said abdomen area and then extending upwardly as a single cord to the top of the bib;

a ring attached to the toe end of each cord at the toe;

a waterproof coating for sealing said cord within said wader walls; and

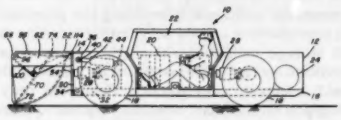
a flap for disposing over the ring on the toe of the waders.

4,117,610

COMBINATION BULLDOZER BLADE AND BUCKET ASSEMBLY FOR EARTH WORKING EQUIPMENT

George A. Yates, 111 Woodlawn Ave., Grove City, Ohio 43123

Continuation of Ser. No. 713,640, Aug. 12, 1976, abandoned.
This application Oct. 26, 1977, Ser. No. 845,823
Int. Cl.[2] E02F *3/76*
U.S. Cl. 37—117.5 8 Claims



1. A combination bulldozer blade and scoop assembly for earth working equipment comprising,

support means to support a bulldozer blade and a scoop in operative position for bulldozing with a bulldozer blade and for transporting material in a scoop,

a bulldozer blade fixedly secured to said support means and having an upper edge portion and a lower edge portion,

a scoop having a bottom portion and a pair of parallel side portions connected to said bottom portion, said scoop bottom portion having an arcuate semi-cylindrical configuration, each of said scoop side portions having an edge portion,

pivot means pivotally connecting each of said scoop side

portions to said support means to thereby pivotally connect said scoop to said support means with said bulldozer blade positioned within said scoop bottom portion,

each of said scoop parallel side portions having a bracket plate secured thereto and depending downwardly below said pivot means,

said scoop arranged to move through a circular path around said bulldozer blade so that in a first retracted position of said scoop said bulldozer blade is in an operative position for bulldozing and, in a second advanced position of said scoop said bulldozer blade provides the back wall of an upwardly open bucket, and

piston cylinder assemblies connected at one end to said support means and at the other end to said bracket plates secured to said scoop side portions at a location below said pivot means and said support means, one end of said piston cylinder assemblies connected to said support means at an elevation above the connection of said other end so that upon extension of said piston cylinder assemblies said scoop pivots about said pivot means and moves around said bulldozer blade lower edge portion in a circular path from a retracted position to an extended position while said scoop remains at an elevation below said support means.

4,117,611

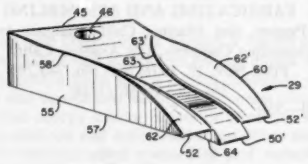
DIGGING TEETH FOR AN EXCAVATING BUCKET

Charles Wayne Hemphill, 800 S. 5th Ave., Mansfield, Tex. 76063

Division of Ser. No. 715,560, Aug. 18, 1976, Pat. No. 4,037,337. This application Apr. 29, 1977, Ser. No. 792,339

Int. Cl.[2] E02F *9/28*

U.S. Cl. 37—142 R **9 Claims**



1. A digging tooth for attachment to the lip of an excavating bucket, said tooth having a leading end spaced from a trailing end;

a shank formed at said trailing end by which said tooth can be affixed to a digging implement; a ground engaging member formed at said leading end so that movement of the tooth in a direction towards said leading end enables said tooth to engage the ground and excavate material therefrom;

said ground engaging member includes a penetrating member and a secondary member, said penetrating member extends forward of said secondary member;

said secondary member has a forward ground engaging edge and an upper face, said upper face commences at said edge and upwardly slopes towards said trailing end;

opposed sidewalls, said penetrating member and said secondary member each have one of said opposed sidewalls; said penetrating member has an upper face which commences at one said sidewall and slopes downward towards said face of said secondary member; said penetrating member is progressively reduced in crosssection towards the leading end thereof and terminates in a pointed chisel;

said secondary member includes a forward terminal end portion in the form of a cutting edge which extends substantially half of the width of the tooth;

a wall, said chisel of said penetrating member and said cutting edge of said secondary member are spaced from one another by the last said wall with the last said wall being spaced from each of said opposed walls.

4,117,612

SMOOTHING OR PRESSING IRON

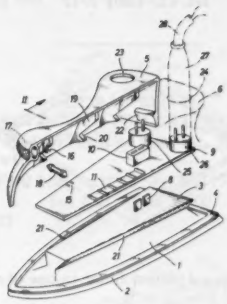
Erich Rudolf Baumgartner, Tiroler Platz 4, and Peter Doehler, Kaulbachstrasse 59, both of Munich, Fed. Rep. of Germany

Filed Mar. 1, 1977, Ser. No. 773,252

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1976, 2608500

Int. Cl.[2] D06F *75/34*

U.S. Cl. 38—91 **16 Claims**



1. A smoothing or pressing iron comprising a sole-body including a heating means for applying heat, a housing clamped to said sole-body, and a clamping means, said sole-body further comprising a first set of inclined surfaces located on opposite sides of said sole-body extending downwardly and converging inwardly with respect to the normal position of the iron when in use, said housing comprising two housing halves which, on the inner sides thereof, have a second set of inclined surfaces for cooperating with said first set of inclined surfaces, said clamping means engaging said housing halves for clamping said housing halves together to urge said second set of said inclined surfaces of said housing inwardly against said first set of said inclined surfaces of said sole-body to thereby grip said sole-body with said housing halves via said inclined surfaces.

4,117,613

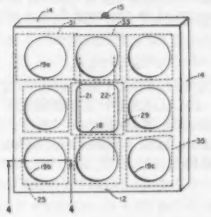
PICTURE DISPLAY ASSEMBLY

Thomas M. Hosker, 17 Dona St., Lynn, Mass. 01904

Filed Mar. 29, 1977, Ser. No. 782,422

Int. Cl.[2] G09F *1/12*

U.S. Cl. 40—152.1 **12 Claims**



1. In an assembly for framing a plurality of pictures the combination of a top panel having a like plurality of openings formed therethrough, the area of each said opening being less than that of a picture to be framed thereby, at least one of said openings having a major dimension which may be the diagonal thereof greater in size than a minor dimension of any of said

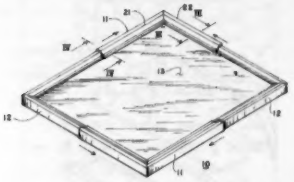
plurality of said pictures whereby said pictures may be inserted through said one of said openings, and resilient backing means disposed behind but not connected to said top panel at any points adjacent said openings said resilient backing means urging said pictures into frictional engagement with the underside of said top panel.

4,117,614

ADJUSTABLE PICTURE FRAMES

Edgar Bickford, Danbury, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Nov. 16, 1976, Ser. No. 742,187
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—155 **1 Claim**



1. A kit for forming a picture frame to one of many desired sizes comprising

a rear panel, and

two pairs of frame sections, with each pair of frame sections formed of two mutually perpendicular arm sections, each formed as an open channel member, and with

each arm section of the first pair of frame sections shaped to telescopically slide over an arm section of one of the second pair of frame sections,

each said frame section shaped to abut, in the assembled condition a front face of a panel mounted in said frame sections and a rear face of a panel mounted in said frame section, in which

each arm section of each first frame section is shaped with a pair of projecting sections that extend for substantially the length of the respective arm section, with one of said projecting sections of each arm section formed to abut the front face of a panel mounted in the frame section and the other of said projecting sections of each arm section formed to abut the rear face of a panel mounted in the frame section, and in which

each second frame section is formed with a projecting section that extends for substantially the length of each arm section, with said projecting section shaped to abut the front face of a panel mounted in the said frame section, together with a tab section on the joint of the two arm sections, which tab section is shaped to abut the rear face of a panel mounted in the said frame section.

4,117,615

VIEWING PANEL FOR PRODUCING MULTIPLE IMAGES OF A DESIGN

Theodore M. Gomolak, Kalamazoo, Mich., assignor to Johnstons & Associates, Inc., Kalamazoo, Mich.

Filed Feb. 10, 1977, Ser. No. 767,471
Int. Cl.[2] G09F *11/00*
U.S. Cl. 40—363 **3 Claims**

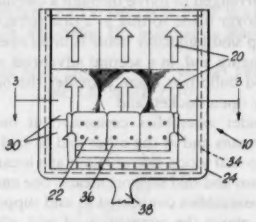
1. A viewing panel for viewing various designs as a background for various pieces of furniture comprising:

a frame having a transparent lens sheet supported in planar relation therein, said sheet having a plurality of fresnel lenses formed therein in adjacent horizontal and vertical rows,

a plurality of silhouette cards having at least one dimension shorter than the corresponding dimension of said frame and sheet and representing the shapes of various articles of furniture,

means on said frame for selectively and removably holding one of said cards in overlapped relation over a portion of said sheet,

and a handle on said frame,



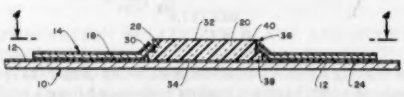
whereby a person holding said frame in spaced relation between his eyes and a portion of a repeating design such as sample of wall paper will see images of the design reproduced in horizontal rows behind one of the silhouette cards.

4,117,616

REFLECTORIZED SYMBOL SIGN AND METHOD OF FABRICATING AND ASSEMBLING

Hugh V. Penton, San Marino, Calif., assignor to California Metal Enameling Company, Los Angeles, Calif.

Filed Nov. 19, 1976, Ser. No. 743,285
Int. Cl.[2] G09F *13/00*
U.S. Cl. 40—550 **8 Claims**



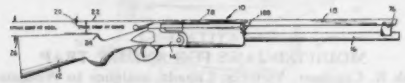
1. In a reflectorized sign symbol construction adapted for attachment to a generally flat front face of a sign panel; the combination of: a sheet-like sign symbol having generally flat front and back faces with at least one reflector opening therethrough, symbol forwardly angled edge portions projecting only forwardly of said front and back faces peripherally defining said reflector opening at and forwardly of said front and back faces; a reflector extending through said symbol reflector opening and having edge surfaces adjacent said symbol angled edge portions, said reflector having a back face generally parallel to and aligned with said symbol back face providing a symbol and reflector coextensive back face for mounting on a flat surface; abutment means between said symbol angled edge portions and said reflector edge surfaces for retaining said reflector in said symbol opening and positively resisting forward and rearward movement of said reflector relative to said symbol angled edge portions; said reflector edge surfaces including inwardly stepped edge surfaces from rearwardly to forwardly forming rearward surface parts and forward surface parts, said symbol angled edge portions overlying said reflector rearward surface parts and pressure edge engaging said reflector forward surface parts, said pressure engagement forming at least a part of said abutment means.

4,117,617

ADJUSTABLE SIGHTING RIB

John P. Linde, Richfield Springs, N.Y.; Martin W. Kopinski, Houston, Tex., and Donald R. Lewis, Little Falls, N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Sep. 30, 1977, Ser. No. 838,135
Int. Cl.[2] F41G *1/00*
U.S. Cl. 42—1 S **25 Claims**



1. In a shotgun having a stock and a gun barrel through which a projectile means is fired, an adjustable sighting means for changing the point of impact of said fired projectile means with a given sight picture, said adjustable sighting means comprising an elongated rib, and means pivotally mounting said elongated rib on said barrel so that the rib pivots about a point rearwardly of said elongated rib and the drop of the stock at the comb remains constant throughout the pivotal movement of the rib.

4,117,618

FISHING POLE WITH SPACED ILLUMINATING MEANS

Charles S. Utsler, Rte. 1, Hackensack, Minn. 56452

Filed Feb. 3, 1977, Ser. No. 765,386
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—17.5 **2 Claims**

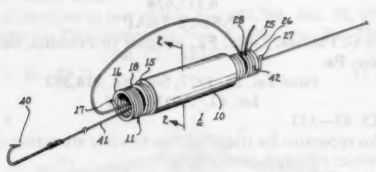
1. A fishing pole comprising a handle; a length of rod attached to one end of said handle; an energy means contained within said handle; a push button switch contained within an other end of said handle and having one contact connected to one side of said energy source; a pair of electrical wires disposed within said rod and connected to an other side of said energy source and an other contact of said switch, and; a plurality of at least three light emitting diodes disposed internal to the length of said rod, distributed along the length of said hollow rod and connected across said pair of electrical wires whereby said light emitting diodes selectively illuminate lengthwise spaced portions of said hollow rod.

4,117,619

SPRING TIE FISHING SINKER

Curtis A. Stevenson, 1424 E. Osborn, #18, Phoenix, Ariz. 85014

Filed Dec. 27, 1976, Ser. No. 754,495
Int. Cl.[2] A01K *95/00*
U.S. Cl. 43—43.1 **10 Claims**



1. A detachable weighted coupling device for connecting the loop of a leader to a fishing line, said device comprising in combination:

a. weight means having a channel extending therethrough;

b. a tightly wound coil spring section extending from said weight means in proximity to at least one end of the channel, said coil spring section defining a cavity in communication with the channel;

c. terminal coil means of said coil spring section for engaging the loop of the leader inserted through the channel and the cavity; and

d. further coil means of said coil section disposed intermediate said terminal coil and said weight means for gripping the fishing line threaded into and out of said further coil means;

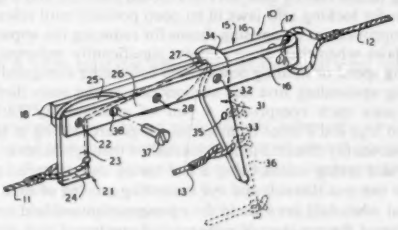
whereby, the gripping force of said coil spring section is increased proportionally to opposing forces applied to the leader and the fishing line.

4,117,620

RELEASE DEVICE FOR DEADFALL TRAPS

Eric Stauffer, 3964 Old Lakelse Lake Dr., Terrace, B. C., Canada (V8G 3V1)

Filed Mar. 1, 1977, Ser. No. 773,323
Int. Cl.[2] A01M *23/00*
U.S. Cl. 43—77 **1 Claim**



1. A release device for deadfall traps of the type having a load line for securing a deadfall in a raised position, the device comprising:

(a) an elongated body member adapted to be anchored at one end,

(b) an L-shaped load line engaging member having a load line engaging arm and a detent engaging arm swingably mounted at the opposite end of the body member for free swinging movement between a load line engaging position in which the load line engaging arm extends substantially at right angles to the body member for receiving a loop of load line and a release position in which the load line engaging arm extends substantially in alignment with the body member for releasing the load line,

(c) an elongated detent member swingably mounted intermediate its ends on the body member adjacent the load line engaging member for free swinging movement and being adapted to be disposed in a set position in which one end extends in the path of and engages the detent engaging arm of the load line member when the latter is arranged in the load line engaging position,

(d) a trigger member swingably mounted on the body member adjacent said one end of the latter, the trigger member having a hooked head portion adapted to be swung into engagement with the opposite end of the detent member when the latter is arranged in a set position for preventing swinging movement of the latter so as to maintain the load line engaging member in the load line engaging position against the pull of the load line, the trigger member having a lever portion for connection to a bait line for swinging the hooked member, upon tension being applied to the bait line, out of engagement with the detent member so as to enable the load line engaging member to swing to the release position.

4,117,621

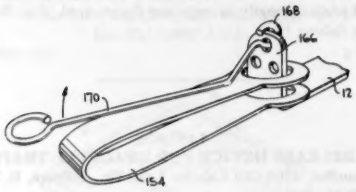
ANIMAL TRAP INCLUDING SPRING-ENGAGING INERTIAL SNUBBER TO REDUCE INITIAL JAW IMPACT

Herbert H. Loeffler, Cambridge, Mass., assignor to Woodstream Corporation, Lititz, Pa.

Continuation of Ser. No. 660,387, Feb. 23, 1976, Pat. No. 4,065,871. This application Jul. 13, 1977, Ser. No. 815,452

Int. Cl.[2] A01M *23/26*

U.S. Cl. 43—88 **2 Claims**



1. In an animal trap of the leghold type having a base, a pair of U-shaped coacting jaws swingably mounted on said base, spring means biasing said jaws to a closed position, and trigger means for locking said jaws in an open position until released, the improvement comprising means for reducing the impact of said jaws when they close without significantly reducing the closing speed or holding power, said base being elongated and having upstanding first and second ears at the ends thereof; said jaws each comprising a pair of substantially parallel spaced legs and a cross member, said legs terminating in laterally outwardly directed pintles journalled through bores in said ears; said spring means being a leaf spring and comprising an eye at one end thereof; said eye encircling one leg of each jaw so that when said jaws are in the open position and said spring is released the eye thereof rides up said one leg of each jaw to thereby close said jaws, said impact reducing means comprising an inertial snubber pivotally mounted in a bore in one of said ears and lying longitudinally along said spring to be operatively engaged by said spring before impact of said jaws to thereby absorb excess spring energy and cause the spring travel to lag behind the jaw travel.

4,117,622

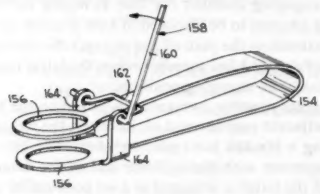
LOW IMPACT ANIMAL TRAP

Herbert H. Loeffler, Cambridge, Mass., assignor to Woodstream Corporation, Lititz, Pa.

Division of Ser. No. 660,387, Feb. 23, 1976, Pat. No. 4,065,871. This application Jul. 13, 1977, Ser. No. 815,450

Int. Cl.[2] A01M *23/26*

U.S. Cl. 43—88 **2 Claims**



1. In an animal trap of the leghold type having a base, a pair of U-shaped coacting jaws swingably mounted on said base, spring means biasing said jaws to a closed position, trigger means for locking said jaws in an open position until released, the improvement comprising means for reducing the impact of said jaws when they close without significantly reducing the closing speed or holding power, said spring means being a leaf spring and said impact reducing means comprising a pair of upstanding legs at one end of said trap at either side of said spring, a crank mounted in bores in said legs and an inertia arm connected to said crank, said crank extending over said spring to be operatively engaged and pivoted by said spring during movement of said jaws from said open to said closed position to thereby absorb spring energy and cause the spring to lag behind the jaws during further movement of said jaws to said closed position.

4,117,623

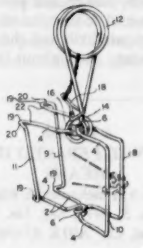
MODIFIED JAWS FOR ANIMAL TRAP

Frank R. Conibear, Victoria, Canada, assignor to Woodstream Corporation, Lititz, Pa.

Filed Aug. 29, 1974, Ser. No. 501,755

Int. Cl.[2] A01M *23/26*

U.S. Cl. 43—90 **10 Claims**



1. In an animal trap of the type having two similar frames, each having jaw forming sides which lie in a common plane and ends extending therebetween to support said jaws, said ends each having a central portion in which the frames are pivotally connected through adjacent ends for rotation about a common axis between set and closed positions and outer portions on each side of the central portion extending to said jaws, a trigger means for releasably maintaining the trap in set position and at least one actuator, capable of rapidly and forcefully effecting such rotation, which has two arms spring-biased at one end so that the other ends, which terminate in rings encircling adjacent ends of both frames on opposite sides of said axis, would, if unobstructed, move apart to a distance substantially greater than the length of said frame ends, the improvement wherein an outer portion of at least one of said ends of a frame encircled by said rings is so shaped, as it progresses radially outwardly from said axis, that it extends to a point out of the common plane of said jaws on the side thereof remote from the other frame when viewed with the trap in closed position, and thence returns to said plane wherein it connects with one end of a jaw, said point being located at a distance from said common axis that is about the same as the distance from said axis to said one end of a jaw.

4,117,624

INSECT TRAP

Dennis G. Phillips, Lititz, Pa., assignor to Pestolite, Inc., Lancaster, Pa.

Filed Jul. 25, 1977, Ser. No. 818,393

Int. Cl.[2] A01M *1/04*

U.S. Cl. 43—113 **5 Claims**

1. An apparatus for trapping insects while attracting them by ultra-violet radiation comprising:

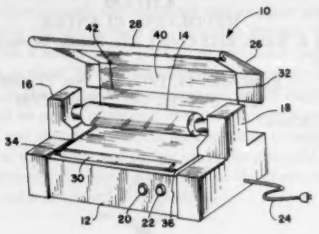
an ultraviolet radiation source;

a support means for supplying electrical power to and supporting the radiation source;

a holder means detachably connected to the support means and oriented to essentially enclose the radiation source on three sides; and

a trapping means, detachably held against the inside surface

of the holder means, comprising a sheet of material reflectorized on one surface, and coated with a sticky substance on that same surface, said sticky substance capable of



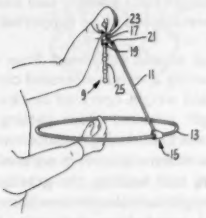
trapping insects, said trapping means being oriented so that the reflectorized sticky surface is facing toward the ultra-violet radiation source.

4,117,625

ROPE SPINNING TOY

James R. O'Neil, 100-36th Ave., San Francisco, Calif. 94122

Filed Jun. 27, 1977, Ser. No. 810,607
Int. Cl.[2] A63H *1/32*
U.S. Cl. 46—51 **2 Claims**



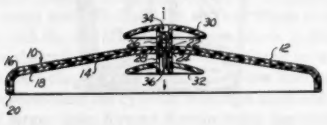
1. A rope spinning toy having a honda wherein said honda includes a U-shaped member of a flexible material having a first end and a second end with a bight between the ends with a first hole near the end in said first end, a second hole near the bight of the second end and a notch in the end of the second end of said U a cord having a loop at one end of said cord over said second hole within said U, the opposite end of said cord being brought through said loop, through said second hole, through said notch and then through said first hole to form stem and loop of the toy.

4,117,626

SOUND-EMITTING TOY FLYING SAUCER

Harry P. Kifferstein, 27250 Harvard, Southfield, Mich. 48076, and Warren M. Kifferstein, 29632 Middlebelt, Farmington Hills, Mich. 48024

Continuation-in-part of Ser. No. 653,786, Jan. 30, 1976, abandoned. This application Nov. 8, 1976, Ser. No. 739,653
Int. Cl.[2] A63H *33/18*
U.S. Cl. 46—74 D **11 Claims**



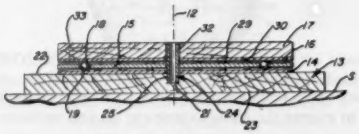
1. In a toy flying saucer comprising a substantially circular dome-shaped body and a downwardly extending rim formed at the periphery of said body, the improvement comprising said body made of lower and upper separable wall portions joined proximate said rim, wherein at least one of said wall portions is made of a resiliently deformable material, an aperture is provided in one of said wall portions, and an air flow actuated noise-making element is disposed in said aperture for emitting a sound when said wall portions are allowed to be resiliently displaced relative to each other thus causing air to circulate through said noise-making element.

4,117,627

ROTATABLE STAND

Henry H. Slingerland, Jr., 2800 Ramona Ct., Wilmette, Ill. 60091

Filed Jun. 3, 1977, Ser. No. 803,342
Int. Cl.[2] A47G *7/00*
U.S. Cl. 47—39 **8 Claims**



1. A freely rotatable, effectively tilt-free plant stand comprising:

a base member;

a metal lower bearing plate facially adhesively secured to said base member and having a small central opening;

a ball race plate formed of wood facially superposed to said lower bearing plate and having an annular array of circumferentially spaced peripheral through holes;

a metal upper bearing plate facially superposed to said ball race plate and having a small central opening;

a plurality of ball bearings received one each in said holes and having a diameter greater than the thickness of said ball race plate to have rolling engagement with each of said lower and upper bearing plates;

an axle member fixedly secured to said base member and projecting upwardly therefrom freely through said lower bearing plate opening, said ball race plate coaxially of said annular array, and said upper bearing plate opening for maintaining free coaxial rotatability of said upper bearing plate on said ball bearings in said annular array; and

a mounting plate facially adhesively secured to said upper bearing plate for rotation therewith coaxially of said array.

4,117,628

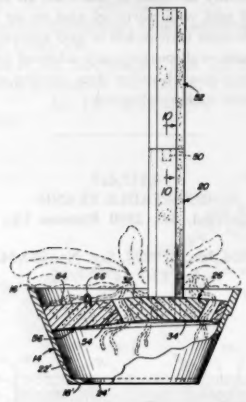
CULTURE AND GROWTH SYSTEM FOR EPIPHYTIC PLANTS

Robert C. Smith, Rte. #6, Pembroke Hwy., Statesboro, Ga. 30458

Filed Jun. 14, 1977, Ser. No. 806,494
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—59 **12 Claims**

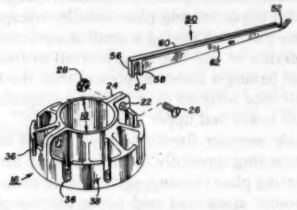
1. In combination with a container having a downwardly converging interior wall, a cultural support for epiphytic plants comprising a support body made of a water impermeable material which is not normally subject to decay, said support body including a peripheral edge wedgingly engaged with the container, said peripheral edge having openings formed therein through which air circulation is conducted, said supporting body having external surfaces vertically spaced from each other by said peripheral edge, an upper one of the surfaces having a convex curvature gravitationally

inducing drainage of liquid collected thereon through the openings in the peripheral edge, and means for supporting and



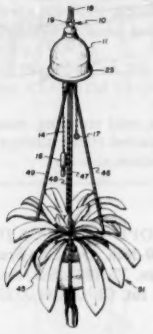
anchoring roots of epiphytic plants externally on said upper surface to expose the roots to ambient air and moisture.

4,117,629
POT HOLDING ARM SUPPORT
Paul Ekdahl, Dutch Lane Rd., Freehold Township, Monmouth County, N.J. 07728
Filed Aug. 9, 1977, Ser. No. 823,120
Int. Cl.[2] A01G 9/02
U.S. Cl. 47—67 **20 Claims**



1. A pot-holder assembly for holding flowers, plants and the like and characterized in that a plurality of pot holding arms are removably mounted in a receiving member, the assembly including: (a) a receiving member having a semicircular configuration with a determined inner diameter ring-like portion and an outer periphery and rim portion; (b) a plurality of like slots formed in the outer periphery of the rim portion of said receiving member, each of said slots open to the top of the receiving member, and providing on each side of the slot a rim portion providing a retaining shoulder means; (c) means for retaining the outer peripheral rim in spaced alignment with the inner ring-like portion; (d) securing means provided on the semicircular member enabling one semicircular member to be secured to a like member to form a ring-like receiving member, said securing means also enabling the semicircular member to be fastened to a wall; (e) at least one arm with an outer means for engaging and supporting a bail, chain and the like by which a pot and the like may be hung from an arm that is removably mounted in and on the receiving member; (f) said arm having two rib portions on each side of a theoretical center line of the arm, these rib portions engaging the outer peripheral rim at least on its inner surface of the rim and at two spaced-apart portions, and (g) means provided on said arm and cooperatively arranged in spaced array from said rib portions to maintain the mounted arm in a determined attitude and position on the receiving member.

4,117,630
REVOLVING PLANTER
Barbara A. Kalas, 8615 Colfax Ave. South, Minneapolis, Minn. 55420
Filed Mar. 14, 1977, Ser. No. 777,008
Int. Cl.[2] A01G 9/02; G09F 11/00
U.S. Cl. 47—67 **7 Claims**



1. A revolving hanger for a planter, said hanger comprising a supporting member adapted to be supported from a suitable supporting surface,

a housing secured to and supported from said supporting member and having a weight operated clockwork mechanism therein, said weight operated clockwork mechanism having a weight actuated chain passing over a rotary toothed clockwork actuating member with which it is coupled so that when a planter is secured to said planter support beneath said housing the gravitational force exerted by the weight as it descends will cause actuation of said clockwork mechanism and slow rotation of the planter, and

a planter support projecting down from and beneath said housing and adapted to support a planter therefrom,

said clockwork mechanism being designed to cause relative rotation between said supporting member and said housing to cause slow rotation of said planter support about the axis thereof and relative to said supporting surface.

4,117,631
POTTED PLANT WATERING MEANS
Steven L. Tull, 17424 Strathern, Northridge, Calif. 91324
Filed May 12, 1977, Ser. No. 796,140
Int. Cl.[2] A01G 27/00
U.S. Cl. 47—81 **10 Claims**

1. A well and wick type watering device for engagement in the bottom of a flower pot having a bottom, vertical sides and an upper rim and in which soil is deposited; said device includ-

ing a formable container arranged in and conforming to a lower portion of the pot beneath the soil therein and having flexible walls defining a water supply chamber, an elongate substantially vertically extending tubular neck with a lower end communicating with the container and an open upper end arranged above the top surface of the soil in the pot, an elongate wick with a lower inner portion in the lower portion of the chamber defined by the container, a central portion engaged through the container in substantial sealed engagement therewith and an upper outer end portion extending upwardly into said soil and support means in the container to support the overburden of soil above and acting upon the container and to maintain adjacent and opposing portions of the chamber defining flexible walls in spaced relationship.

4,117,632
PLANT WATERING DEVICE
Woodrow W. Pearce, 911 Air Way, Glendale, Calif. 91201
Filed Jul. 1, 1976, Ser. No. 701,558
Int. Cl.[2] A01G *27/00*
U.S. Cl. 47—81 **9 Claims**

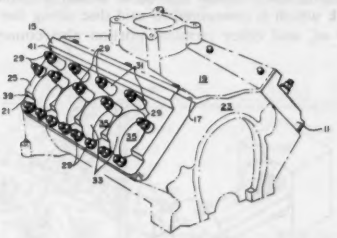
1. A plant watering device including a container containing material for growing a plant, means below the container for holding a supply of water, at least one probe extending upwardly in the container into said material, the probe having a central bore and being perforated so that a passage is provided through said probe between said material and said means for holding a supply of water, and a wick having one end submerged in water contained in said means for holding a supply of water and extending upwardly through the probe and out through a perforation in said probe with a second end of said wick being wrapped around the outside of the probe forming convolutions positioned in contact with said material whereby water can be drawn up through the wick by capillary attraction and into and out through the probe and delivered to the material in the container.

4,117,633
HONING PLATE
Cecil L. Yother, 1932 Vining St., San Leandro, Calif. 94579
Filed Sep. 12, 1977, Ser. No. 832,574
Int. Cl.[2] B24B *41/00*
U.S. Cl. 51—262 R **5 Claims**

1. An improvement in a honing plate which is bolted to an engine block during re-boring and honing of the cylinder walls within said engine block to stress and distort said engine block to simulate its natural operating condition, comprising

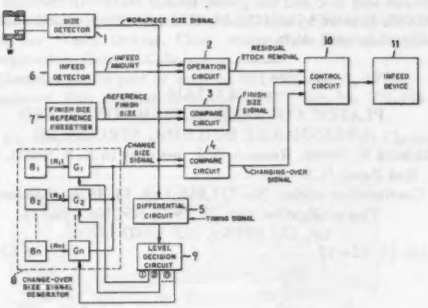
a solid metal plate having a flat surface which is formed to mate with the surface of said engine block in the position where the cylinder head is normally affixed to said engine block, said plate having formed therein a first set of holes to accommodate the cylinder head bolt studs and a second set of larger holes formed therein being disposed concentric with and slightly larger than the cylinder bores in said engine block when said plate is mounted thereon, and

said plate having a varied thickness and means for attachment of the engine intake manifold thereto, whereby said plate imposes forces on said engine block which cause the normal stress and distortion to occur within said engine



block as when the cylinder heads and intake manifold are secured in operative position thereon.

4,117,634
CONTROLLING METHOD FOR A GRINDING MACHINE
Terumitsu Sugita, and Yasuo Tateishi, both of Narashino, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Japan
Filed Jan. 31, 1977, Ser. No. 764,074
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—281 R **5 Claims**



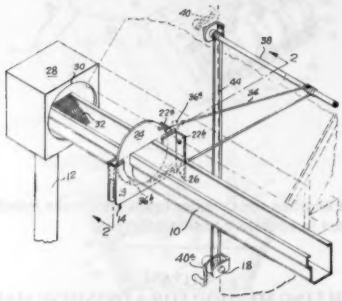
1. A method of controlling a grinding machine during grinding of a workpiece, comprising:

rough grinding the workpiece; measuring a rate of stock removal during a reference interval during the rough grinding of the workpiece; comparing the value of stock removal rate measured during the rough grinding with a predetermined reference value of stock removal rate corresponding to a particular value of workpiece dimension; measuring the value of the workpiece dimension during the rough grinding; and changing from rough grinding to fine grinding of the workpiece when the measured value of the workpiece dimension is equal to the reference value of the workpiece dimension corresponding to the measured value of stock removal rate.

4,117,635
EASY CLEAN EAVE TROUGH
Vernon L. Nelson, Rte. 2, Box 115, Portland, Oreg. 97231
Filed Feb. 3, 1977, Ser. No. 765,289
Int. Cl.[2] E04D *13/06*
U.S. Cl. 52—11 **6 Claims**

1. Apparatus for cleaning a gutter below the eaves of a building comprising: support means for the gutter on a vertical face of the building, and means to rotate and invert the gutter so as to empty any accumulated debris including at least one disc surrounding said gutter carried on said support means connected to a shaft which is horizontally offset from and

parallel to said gutter, said shaft also supported on a vertical face of the building, said disc and said shaft connected by a single flexible element, said flexible element having two terminal portions, one terminal portion of which is connected to a first link which is connected to said disc along the outer periphery of, said other terminal portion also connected to a



second link which is connected to the outer periphery of said disc diametrically opposed from said first link, said flexible element having a medial portion which is wound about said shaft and means to rotate said shaft so that when said shaft rotates said disc and the gutter rotates therewith through said flexible element by said flexible element wrapping and unwrapping about said shaft.

4,117,636

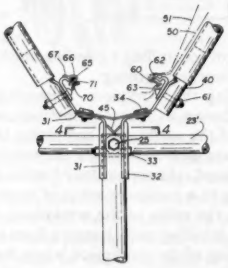
PLASTIC COVERED GUTTER CONNECTED GREENHOUSE BUILDING STRUCTURE

Richard W. Smith, Rumson, N.J., assignor to X. S. Smith, Inc., Red Bank, N.J.

Continuation of Ser. No. 731,863, Oct. 13, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 790,111

Int. Cl.[2] **E04B** *1/315;* **E04D** *13/00*

U.S. Cl. 52—13 **6 Claims**



1. In a greenhouse building structure comprising a plurality of rafter members positioned in spaced apart relationship, and secured at their ends upon columns, fastening means for securing the ends of plastic covers along the length of the structure, said fastening means comprising a longitudinally extending male member, a longitudinally extending female member, said members providing inter-fitting splined portions along their length within a V-shaped clamping area and between which the end of a plastic cover is to be clamped, said female member providing a flange integrally formed and extending substantially along the length thereof parallel with said splined portions and screw means perpendicular to and threaded through said flange for pressing against an outer surface of a leg of the Vshaped area of said male member for clamping said splined portions and said V-shaped areas together.

4,117,637

CYCLIC SHEAR ENERGY ABSORBER

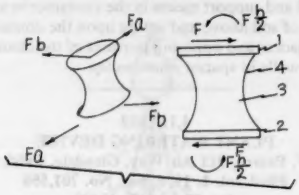
William Henry Robinson, 9 Nikau St., Eastbourne, New Zealand

Filed Oct. 12, 1976, Ser. No. 731,453

Claims priority, application New Zealand, Oct. 14, 1975, 178949

Int. Cl.[2] **E04B** *1/34*

U.S. Cl. 52—167 **46 Claims**



1. A cyclic shear energy absorber to be interposed between members of a structure which may be caused by incoming energy to oscillate relative to each other, said absorber comprising a first portion engagable to one member of the structure and a second portion spaced from said first portion which is engagable to a different member of said structure, said different member being one that may be caused to oscillate relative to the member to which said first portion is engaged, there being fixed in a sandwich-like manner plastically strainable cyclically in shear between said two portions at least one member of lead, the cross-section of said lead in a plane substantially parallel to the sandwich-like arrangement of said lead and said two portions is substantially rectangular and at least one of the sides of the cross-sectional area is smaller adjacent the center of the lead in the sandwich-like arrangement.

4,117,638

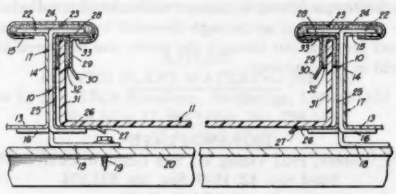
SKYLIGHT FOR STANDING RIB METAL ROOFS

James M. Kidd, Jr., Smyrna, and Jay G. Woods, Forest Park, both of Ga., assignors to Atlanta Metal Products, Inc., Atlanta, Ga.

Filed Nov. 25, 1977, Ser. No. 854,544

Int. Cl.[2] **E04D** *13/03;* **E04B** *7/18*

U.S. Cl. 52—200 **10 Claims**



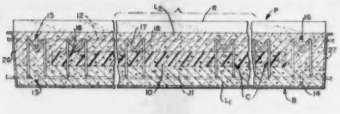
1. In a standing rib metal roof having multiple side-by-side metal roof panels and intervening roof panel support clips for attaching the roof panels to purlins and cap strips for locking the opposing side walls of adjacent roof panels to said intervening clips, the improvement which comprises a skylight panel disposed between one pair of said clips in the space normally occupied by a metal roof panel, and a pair of side metal suspension channels mounted on opposite side walls of the skylight panel and floatingly supporting the skylight panel for restricted movements relative to said suspension channels and other components of the standing rib roof, and said side metal suspension channels configured for engagement with said support clips and said cap strips in substantially the same manner that the metal roof panels of the standing rib roof are engaged with said clips.

4,117,639

REINFORCED INSULATED CONCRETE BUILDING PANEL

Thomas William Steenson, Richmond Hill, and W. Donald Paton, Aurora, Canada, assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Jun. 29, 1977, Ser. No. 811,300
Int. Cl.[2] E04B *1/16, 2/28*
U.S. Cl. 52—223 R **3 Claims**



1. In a reinforced insulated concrete building panel having an inner layer of concrete, an outer layer of concrete, a layer of insulating material sandwiched therebetween, and prestressed reinforcing strands extending longitudinally through the inner and outer layers of concrete, the improvement comprising a plurality of reinforcing shear connectors embedded in the inner layer of concrete and extending through the layer of insulation into the outer layer of concrete to bond the layers together into a composite panel and to prevent delamination failure of the panel, said shear connectors each being spaced from all of the reinforcing strands, each shear connector being generally U-shaped, and having a pair of depending legs joined at one of their ends to a bight portion, the bight portion being bent downwardly in the central portion thereof to extend generally in the same direction as the legs to define a depth gauge, whereby the legs may be inserted through the layer of insulating material and into one of said layers of concrete until the depth gauge contacts the layer of insulating material, thus leaving a portion of the shear connector exposed above the layer of insulating material, the other ends of each of the depending legs having terminal portions extending in a common direction at approximately a right angle to the axis of the leg to form a secure bond between the one layer of concrete and the shear connector, said terminal portions being spaced from all of said reinforcing strands whereby said shear connectors are in spaced relationship with said reinforcing strands, said shear connectors being positioned such that the legs thereof lie in a plane generally parallel to the longitudinal axis of the panel, whereby during manufacture of the panel the shear connector can be readily accurately and securely positioned at a proper depth in the panel.

4,117,640

THERMAL BARRIER SYSTEM FOR PANEL INSTALLATIONS

Cornelius Christian Vanderstar, 813 N. Foothill Rd., Beverly Hills, Calif. 90210

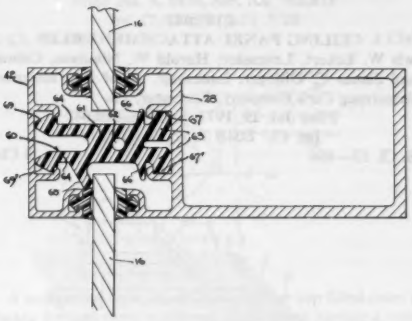
Filed Mar. 14, 1977, Ser. No. 776,992
Int. Cl.[2] E04B *1/62*
U.S. Cl. 52—398 **14 Claims**

1. A thermal barrier system for panel installations comprising:

at least one gutter member including means for attachment to a structure, said gutter member defining first forwardly facing slot means and including first flange means adjacent said first slot means;

at least one face member, said face member defining second rearwardly facing slot means and including second flange means adjacent said second slot means;

at least one coupler member comprising a unitary body of heat insulating material, the latter member having first connector means rotatable in one direction in said first slot means of said gutter member to form a locking engagement with said first slot means and said first flange means, said coupler member further including resilient second connector means snap fittable into said second slot means of said face member to form a locking engagement with said second slot means and said second flange means, said first connector means and said second connector means being disengageable from said gutter member and said face member, respectively, by a reverse rotation of said coupler member; and means adjacent said first and second slot means, respectively, for engaging and holding an edge of a panel member.

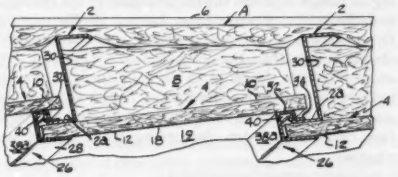


4,117,641

INSULATION SYSTEM FOR BUILDING STRUCTURES

David Lee Wells, Denver, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 691,689, Jun. 1, 1976, abandoned. This application Mar. 11, 1977, Ser. No. 776,694
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—404 **11 Claims**



1. An insulation system for building structures having a plurality of parallel structural members and a covering material spanning the structural members on the exterior side, both the structural members and the covering material having a relatively high coefficient of thermal conductivity, comprising:

(a) first insulation board-like means for isolating the structural members from the interior of the building, said first insulation means being supported along a first edge portion adjacent to a lower portion of a first structural member, said first insulation means spanning to and having a second edge portion extending beneath an adjacent second structural member,

(b) a second insulation means located adjacent to and above a major surface of said first insulation means and between adjacent structural members, said second insulation means having a lower density and a higher thermal insulation value than said first insulation means,

(c) fastening means for urging the second edge portion of said first insulation means into contact with the lower portion of said second structural member,

(d) said fastening means comprising clip means for holding the second edge portion of said first insulation means onto said structural member such that a portion of said clip means provides support for a first edge portion of an adjacent first insulation means, said clip means extending

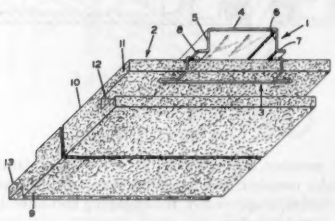
from a major surface on said first insulation means opposite said structural member, around a minor surface of said second edge portion, and onto an upper surface of the lower portion of said structural member.

4,117,642

CEILING PANEL ATTACHMENT CLIP

Lewis W. Eckert, Lancaster; Harold W. Nikolaus, Columbia, and James C. Ollinger, Lancaster, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jul. 29, 1977, Ser. No. 820,047
Int. Cl.[2] E04B 5/57; E04D 1/34
U.S. Cl. 52—486 **3 Claims**



1. A ceiling construction comprising:
(a) at least one support channel fastened to the structural ceiling of a room, said support channel having two flanges horizontally disposed, one on each side of the support channel;
(b) an acoustical fibrous ceiling panel having a front and back surface, said back surface being positioned adjacent said support channel, at least two opposite edges of the panel having flanges projecting therefrom, one edge having its flange adjacent the back surface of the ceiling panel and the other opposite edge having its flange near the front surface of the ceiling panel, said flanges having a thickness less than the thickness of the ceiling panel as measured from the front to the back surfaces thereof;
(c) clip means engaging the flanges of the support channel and the flange of the ceiling panel adjacent the back surface thereof to fasten the ceiling panel to the support channel;
(d) the improvement comprising:
(1) forming the clip means from spring steel;
(2) said clip means having two ends, each end engaging one of said flanges of said support channels;
(3) said clip means having legs extending from its ends and bent around the flange of the ceiling panel; and
(4) said clip means having a body portion bearing against the ceiling panel flange and connecting together said leg means.

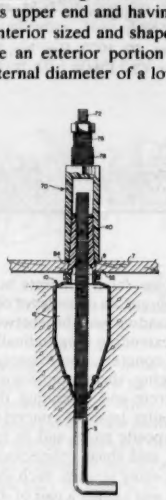
4,117,643

ANCHOR BOLT THREAD PROTECTOR AND SLEEVE SYSTEM

Surguies M. Lamothe, 1813 Feronia St., Metarie, La. 70005

Filed Feb. 22, 1977, Ser. No. 770,283
Int. Cl.[2] E04B 1/41; E04C 5/07; F16B 35/00, 37/00
U.S. Cl. 52—699 **27 Claims**

1. An assembly for securing, protecting and enabling adjustment of an anchor bolt in a body of concrete or the like which comprises the combination of:
(a) a sleeve open at both ends which fits onto and provides a void space around a segment of the intermediate length of the anchor bolt, said sleeve having connecting means exteriorly positioned in proximity to its upper end;
(b) a hollow, generally cylindrical connecting member open at both ends and having interiorly positioned connecting means in proximity to its lower end interconnectable with said exteriorly positioned connecting means of the sleeve to effect detachable attachment between the connecting member and the sleeve, said connecting member additionally having a radially inwardly deformable portion; and
(c) a hollow tubular fastening member open at its lower end and closed at its upper end and having a generally cylindrical hollow interior sized and shaped to fit around and securely engage an exterior portion of said connecting member, the internal diameter of a lower interior portion



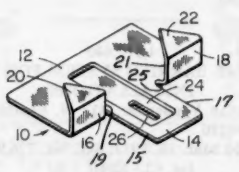
of said fastening member being undersized relative to the external diameter of an exterior portion of said connecting member so that when said fastening member is fitted onto said connecting member said lower interior portion engages said exterior portion and causes the radially deformable portion of said connecting member to deform inwardly to effect gripping engagement between a portion of the interior of said connecting member and a threaded portion of the anchor bolt inserted therein.

4,117,644

WALLBOARD FASTENER

Roger Neil Weinar, 168 W. Woodside Ave., Buffalo, N.Y. 14220

Filed Oct. 28, 1976, Ser. No. 736,425
Int. Cl.[2] E04B 1/38
U.S. Cl. 52—714 **7 Claims**



1. Wallboard fasteners useful for holding a first wallboard panel to a framing member at an end thereof and for joining to a second wallboard panel to be installed coplanar with and having an end thereof abutting the held end of the first panel so that parts of said fasteners, on installation of the second wallboard, contact the first panel, to which said fasteners are not joined, and prevent transverse movements of the second panel, which fasteners are each of a single piece of sheet metal having a substantially flat plate portion, a tongue portion extending from the plate portion and coplanar therewith, a pair of web portions, one on each side of the tongue portion and each extending at a right angle from said plate portion and an impaling flange portion extending from each web portion in the same direction essentially parallel to and overlying said plate portion and opposite to the direction in which the tongue

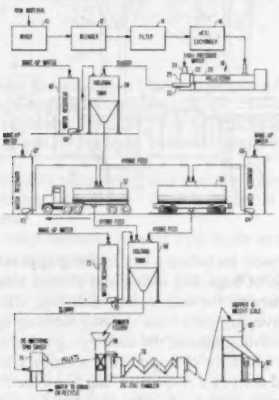
extends so that the plate portion may contact the surface of the wallboard panel while the impaling flange portion is impaling said panel at an edge thereof, said fasteners including a walled depressed area in the plate and tongue portions with a longitudinal slot in the tongue portion, the depression being in a direction opposite to that in which the webs extend, and said fasteners being free of impaling portions extending in the direction of the tongue portion and being free of webs extending beyond the depression from the tongue and from the plate portions in the direction the depression extends from such portions.

4,117,645

METHOD FOR HANDLING AND TRANSPORTING THERMOPLASTIC MATERIALS

Michael Phillips, Pittstown, N.J., assignor to L.A. Dreyfus Company, Plainfield, N.J.

Filed Aug. 19, 1977, Ser. No. 826,036
Int. Cl.² B65B *3/00*
U.S. Cl. 53—431 **7 Claims**



1. In a process for handling and transporting thermoplastic material in bulk, which material exhibits adhesive and agglomerative characteristics at ambient or higher temperature, the improvement comprising:

providing pelletizing means having an inlet for receiving thermoplastic material and an outlet for expelling pellets formed therefrom;

providing a source of water or other fluid under a high pressure in communication with said pelletizing means at the outlet therefrom;

pelletizing said material in said means and simultaneously entraining said pellets in water from said source to form a slurry of said pellets in said water;

providing a water tight bulk shipping container;

conveying said slurry to said container and admitting said slurry into said container;

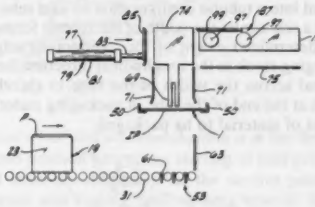
adjusting the concentration of the slurry in said container so that said pellets are present in a concentration of about 40 to 60%, by weight, and are covered with water whereby said pellets may be transported as a slurry in said container to eliminate agglomeration thereof during shipping.

4,117,646

METHOD OF APPLYING A LID TO A CASE

Robert C. James; David A. Wilson, both of Sheboygan, and Dennis P. Horsman, Sheboygan County, all of Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Jul. 9, 1976, Ser. No. 703,973
Int. Cl.² B65B *7/20, 7/28*
U.S. Cl. 53—488 **3 Claims**



1. A method of applying a lid to an open top filled case, said lid being formed from a flat one piece blank having a central panel and side and end flaps at the sides and ends of the central panel adapted to be folded down on fold lines on the sides and ends of the central panel, with one of the pairs of flaps constituting major flaps and having end portions extending out beyond said central panel and with the other pair of flaps constituting minor flaps, said method comprising the steps of:

applying adhesive to selected areas of said blank for securement of said outer end portions of said major flaps to said minor flaps;

placing a blank in an initial blank position;

lifting a filled case from a position below said initial blank position to engage said blank and to move it upwardly along a vertical path to a raised position;

folding down the major and minor flaps of the lid blank on the case as the lid blank and the case are moved upwardly toward said raised position;

effecting partial folding of the outer end portions of said major flaps on vertical fold axes in on said minor flaps by the upward movement of said case and said lid bank while the case and the lid are being lifted;

moving said case with said partially formed lid thereon laterally when the case is in its said raised position into major flap-to-major flap abutting engagement with a previously lidded case while pressing a trailing major flap of the partially formed lid in against its case so that the major flaps of said partially formed lid are pressed in against their respective case; and

compressing said partially folded in outer end portions of said major flaps and said minor flaps of said partially formed lid against one another and against its respective case while both of said major flaps of said partially formed lid are under compression thereby to square up said lid on its case and to effect the securement of said outer end portions and said minor flaps together while the lid is squared up.

4,117,647

FLEXIBLE POUCH, FORMING, FILLING AND SEALING MACHINE

Alfred F. Rossi, 503 Old Woods Rd., Wyckoff, N.J. 07481

Continuation of Ser. No. 734,034, Oct. 20, 1976, abandoned. This application Jun. 27, 1977, Ser. No. 810,679
Int. Cl.² B65B *10/46, 57/14, 9/08*
U.S. Cl. 53—502 **33 Claims**

1. A packaging machine: comprising

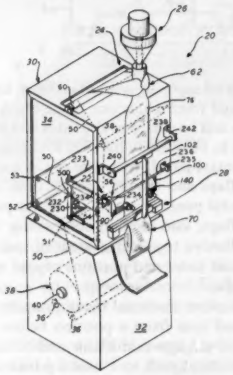
(a) component support means;

(b) packaging stock support means carried by said component support means for positioning a supply of flat packaging stock proximate the beginning of a stock feed path;

(c) stock feed means for feeding packaging stock to and through said stock feed path;

(d) a tube former carried by said component support means proximate said stock feed path for receiving packaging stock as it moes therealong and for forming the flat stock into a tubular configuration with the longitudinally extending edges of the stock overlapping but not secured together;

(e) packaging material sealing means carried by said component support means proximate said stock feed path and for coaction with the packaging material after it has been formed into a tubular configuration by said tube former to effect a seal across the width of the tube so formed and for a predetermined extent of the overlapping edges of the packaging stock in the longitudinal direction thereof from the seal across the width of the tube to thereby form a pouch at the end of the tube of packaging material for the receipt of material to ba packaged;



(f) material directing means carried by said component support means proximate said stock feed path for directing material to be packaged into the pouch formed at the end of the tube of packaging material;

(g) material responsive means carried by said component support means and responsive to the amount of material entering the pouch at the end of the tube of packaging material;

(h) selectively settable means coacting with said material responsive means and selectively settable to a plurality of desired amounts of material; and

(i) control and circuit means interconnecting said stock feed means, said package material sealing means, and said material responsive means into an integrated and coordinated system, said material responsive means providing an output signal to arrest the flow of material to said material directing means upon sensing that the selective set amount of material has been deposited in the pouch.

4,117,648

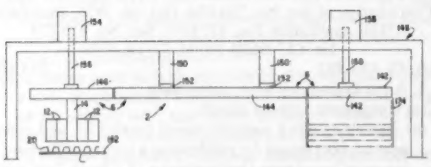
AUTOMATIC COLLATOR

James A. Goodman, 540 Lincoln Ave., Glencoe, Ill. 60022

Filed Apr. 28, 1977, Ser. No. 791,698

Int. Cl.[2] B65B *5/08, 35/38*

U.S. Cl. 53—537 **22 Claims**



1. A high speed automatic collating apparatus for collating a plurality of flanged containers and positioning the collated containers into a packing carton; said apparatus comprising:

a support structure;

carrier means coupled to said support structure;

a support bracket having means for being coupled to the carrier means;

a collator head assembly coupled to the support bracket;

air vacuum means coupled to the collator head assembly enabling said plurality of flanged containers to be coupled thereto in a predetermined configuration; and

collating means coupled to the collator head assembly for overlapping the flanges of adjacent containers to form a collated group at a time after said containers are coupled to the collator head assembly.

4,117,649

SYSTEM FOR FORMING, FILLING AND CLOSING BAGS

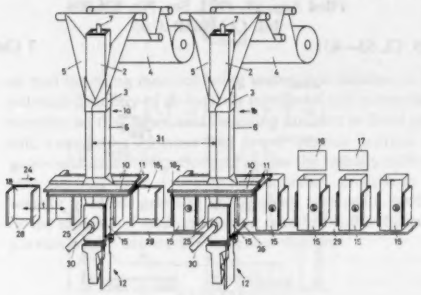
Alwin Egli, Beringen, Switzerland, assignor to Sig Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Mar. 29, 1977, Ser. No. 782,545

Claims priority, application Switzerland, Mar. 29, 1976, 3887/76

Int. Cl.[2] B65B *1/02, 3/02*

U.S. Cl. 53—558 **1 Claim**



1. In a system including a bag forming apparatus for forming a succession of bags, bag filling and closing means, and a conveying apparatus for conveying each bag, after it is formed, along a conveying path from the bag forming apparatus to the filling and closing means, the conveying apparatus being composed of a plurality of supporting members each serving to support and convey a respective bag from the forming apparatus, the improvement wherein: said bag forming apparatus is disposed laterally to one side of the conveying path defined by said conveying apparatus; said bag forming apparatus comprises a bag transporting member mounted to undergo forward and return movement perpendicular to the conveying direction for inserting each bag, after it has been formed, into a respective supporting member, whereby the conveying apparatus can convey bags which were previously formed while further bags are being formed by said bag forming apparatus; each of said supporting members has a U-shaped cross section in the horizontal plane; said bag transporting member has a horizontal arm defining a bag supporting surface and a vertical arm which give said bag transporting member an L-shaped cross section in a vertical plane transverse to the conveying path; said conveying apparatus comprises means defining a stationary supporting surface extending along the conveying path beneath said supporting members for supporting the bottoms of bags being conveyed by said conveying apparatus, the stationary surface having a gap adjacent said bag transporting member into which gap said horizontal arm moves, during forward movement of said bag transporting member, to come into alignment with said stationary supporting surface; and said conveying apparatus further comprises means defining a mov-

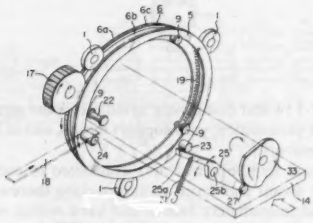
able bag supporting surface movable between a rest position in which said movable supporting surface is disposed in the gap and at the same level as the stationary supporting surface and a retracted position in which said movable supporting surface is spaced from the gap, said movable supporting surface being moved to its retracted position in response to forward movement of said bag transporting member and returning to its rest position during return movement of said bag transporting apparatus.

4,117,650

TAPE WINDING ARRANGEMENT FOR PAPER BUNDLE BINDING APPARATUS

Yukio Ito, Fujisawa, and Susumu Morishima, Kamakura, both of Japan, assignors to Hitachi Denshi Engineering Kabushiki Kaisha and Musashi Kabushiki Kaisha, Tokyo, both of, Japan

Filed Apr. 26, 1977, Ser. No. 791,150
Claims priority, application Japan, Apr. 27, 1976, 51-47210
Int. Cl.[2] B65B *13/04, 27/08*
U.S. Cl. 53—587 **4 Claims**



1. An apparatus for winding a binder tape around a stack of paper sheets, said apparatus comprising::

an annular flyer body having an inner hollow space in which a stack of paper sheets to be bound is adapted to be disposed;

means for rotatably supporting said annular flyer body;

means for rotating said annular flyer body about the center point thereof;

a first guide roller mounted on said flyer body at a predetermined position thereof;

an annular plate supported by said annular flyer body to be coaxial therewith, said annular plate being circumferentially movable with respect to said annular flyer body;

a second guide roller mounted on said annular plate so as to be movable with said annular plate into disengageable contact with said first guide roller for holding and guiding a binder tape in tension in coopertion with said first guide roller;

spring means for urging said second guide roller toward a position to contact said first guide roller; and

means for displacing said second guide roller away from said first guide roller.

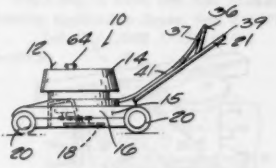
4,117,651

LAWN MOWER WITH CUTTER BLADE INTERLOCK

Herman H. Martin, Jr., Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 12, 1976, Ser. No. 704,282
Int. Cl.[2] A01D *75/20*
U.S. Cl. 56—10.5 **17 Claims**

1. A lawn mower comprising a frame, a rotatable cutter blade supported on said frame, a prime mover supported on said frame, selectively operable means connected to said prime mover for starting thereof, a drive mechanism for selectively connecting said prime mover in driving engagement with said cutter blade, said drive mechanism being movable between a first position wherein said prime mover is drivingly engaged with said cutter blade and a second position wherein said prime mover is disengaged from said cutter blade, means biasing said drive mechanism toward the second position, and interlock means operably connected to said drive mechanism and to said means for starting said prime mover and including an element movable between a first position preventing starting of said



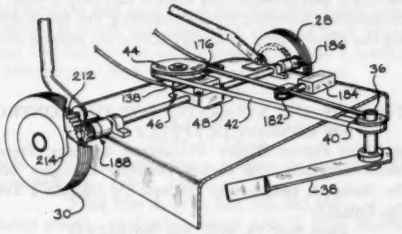
prime mover when said drive mechanism is in the first position and a second position permitting starting of said prime mover when said drive mechanism is in the second position, said biasing means also biasing said element toward the second position.

4,117,652

TRANSMISSION FOR SELF-PROPELLED, WALKING LAWN MOWERS

Ronald N. Jones, Fredericktown, and Devin R. Cline, Mount Vernon, both of Ohio, assignors to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed Sep. 30, 1976, Ser. No. 728,044
Int. Cl.[2] A01D *35/26;* **B62D** *51/04*
U.S. Cl. 56—11.8 **10 Claims**



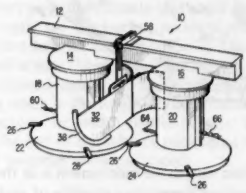
1. In combination, a self-propelled rotary lawn mower having a deck, two substantially aligned drive wheels rotatably supported by said deck, a handle extending upwardly from said deck, an engine mounted above said deck and having a drive shaft extending therethrough, a mower blade affixed to said drive shaft below said deck, a drive pulley affixed to said drive shaft above said mower blade, a transmission having a housing, means mounting said transmission on the lawn mower, an input shaft extending upwardly from said housing and having a driven pulley, a belt connecting said drive pulley and said driven pulley, a first gear mounted on said input shaft within said housing, an output shaft mounted in said housing and extending horizontally outwardly beyond opposite sides thereof, a second gear rotatably mounted on said output shaft in said housing and meshing with said first gear, a clutch dog within said housing affixed to said output shaft at one side of said second gear for rotation with said output shaft and for longitudinal movement with respect thereto, said clutch dog having an engaged position engaged with said second gear and a disengaged position spaced from said second gear, a shifter fork carried by said housing and engagable with said clutch dog, a shift lever carried by said housing for moving said shifter fork and said clutch dog between its two positions, said shift lever being movable by remote control means mounted on the handle of said lawn mower, and means on opposite end portions of said output shaft engagable with said two drive wheels of said mower for driving same.

4,117,653

SPREADING DEVICE FOR DRUM MOWERS

Samuel Allen Tarver, Jr., Hwy. 25 N, Folsom, La. 70437

Filed Aug. 26, 1976, Ser. No. 718,005
Int. Cl.[2] A01D *35/264*
U.S. Cl. 56—13.6 **6 Claims**



1. In a rotary mowing machine including a frame member and at least a pair of rotary mower drums rotatably mounted to said frame member, a spreading device for evenly distributing a mowed crop over a mowed swath comprising:

a crop divider for dividing crops to be mowed, said crop divider secured to said frame member at a position between said mower drums and extending forward of said drums in the direction of mowing, said crop divider including an upstanding main body portion having rewardly extending crop channelling fins;

said mower drums rotating toward said crop divider in said direction of mowing; and,

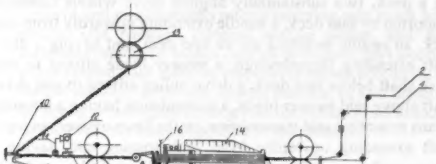
feeder chain means coupled to each of said mower drums for sweeping said mowed crop toward said crop divider and cooperating with said crop channelling fins for distributing the mowed crop uniformly across the mowed swath.

4,117,654

METHOD OF AND APPARATUS FOR THE CONTROL OF COMPOSITE EFFECT YARNS

Georgi Mitev Petrov; Blagoy Alexandrov Andonov; Svetozar Paissiev Trayanov, and Georgi Dimitrov Georgiev, all of Sofia, Bulgaria, assignors to Institute Po Obleklo I Textil, Sofia, Bulgaria

Filed Nov. 18, 1977, Ser. No. 852,616
Int. Cl.[2] D01H *13/22, 13/16*
U.S. Cl. 57—19 **8 Claims**



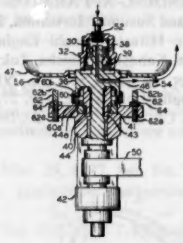
5. Apparatus for controlling composite effect yarn with enlargements, such yarns being formed by twisting components thereof by a driven hollow spindle, comprising a guide for the composite effect yarn disposed a substantial distance downstream of the driven hollow spindle, driven means for pulling the composite effect yarn from the spindle and forwarding it in a span under tension to the yarn guide, means disposed immediately upstream of the yarn guide for catching composite effect yarn in said span having abnormally large enlargements so as at least to slow its forward progress, means for detecting a decrease in tension in the composite effect yarn in the portion thereof between the yarn feeding means and the means for catching abnormally large enlargements in the composite effect yarn, and means responsive to said tension detecting means to stop the feeding of the components into the spindle upon such decrease in tension in the composite effect yarn.

4,117,655

2-FOR-1 TWISTER EQUIPPED WITH ANTIWRAPPING MEMBERS

Kenneth E. Smith, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 8, 1977, Ser. No. 775,501
Int. Cl.[2] D01H *7/86*
U.S. Cl. 57—58.83 **7 Claims**



1. A 2-for-1 twister comprising spindle support means, spindle having a yarn orifice, yarn support means, and at least two antiwrap members,

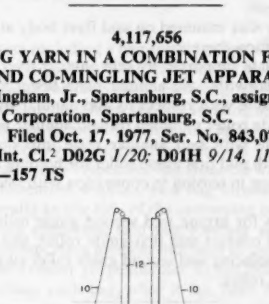
wherein said spindle is rotatably connected to said spindle support means and forms an intersection therewith adjacent and immediately below said yarn orifice, said yarn support means is connected to said spindle above said yarn orifice, and said antiwrap members are positioned adjacent said intersection of the spindle and the spindle support means and equally spaced around said spindle so that the antiwrap members receive wraps of a yarn fed from the spindle upon breakage of the yarn and the wraps of yarn are held out of the intersection of the spindle and the spindle support means.

4,117,656

HANDLING YARN IN A COMBINATION FALSE TWIST AND CO-MINGLING JET APPARATUS

Robert M. Ingham, Jr., Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 17, 1977, Ser. No. 843,078
Int. Cl.[2] D02G *1/20;* **D01H** *9/14, 11/00*
U.S. Cl. 57—157 TS **1 Claim**



1. The method of doffing a combination of a false twist and co-mingling multifilament yarn producing machine having a co-mingling air jet downstream from a false twist producing

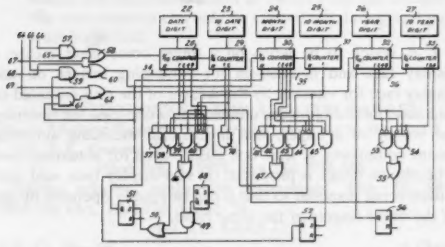
device comprising the steps of: inserting a suction nozzle into the outlet end of the air jet to cut off the end of yarn being produced and direct the yarn being produced to a waste collection point, doffing a completed package while the yarn is being directed to the waste collection point, placing an empty yarn container on the take-up mechanism and moving the nozzle adjacent the empty yarn container to place the yarn being produced on the empty yarn container.

4,117,657

ELECTRONIC TIMEPIECE CALENDAR CIRCUIT

Eisaku Shimizu, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 10, 1976, Ser. No. 748,866
Claims priority, application Japan, Dec. 10, 1975, 50-147001
Int. Cl.[2] G04B *19/24*
U.S. Cl. 58—4 A **14 Claims**



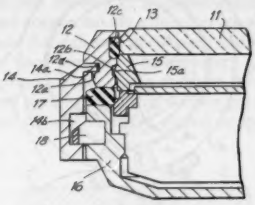
1. In an electronic timepiece having year counter means for producing a signal representative of a leap year and including date counter means adapted to receive a clock pulse having a period of one-day and in response to each said clock pulse received thereby, said date counter means being indexed through a counting cycle from one to at least 31 to thereby produce a date signal representative of the count thereof, and a month counter means for detecting each return of the date counter to a count of one and in response thereto being indexed by a count of one through a counting cycle from one to at least 12 and thereby produce a month signal representative of the count thereof, and control means for receiving said month signal and day signal and when said month signal is representative of a count of two, said control means, in the absence of a leap year signal applied thereto, being adapted to return the date counter means to a count of one in response to detecting when the count of the day counter is changed from 28 to 29, said control means being further adapted, in response to the presence of a leap year signal applied thereto to return the count of the day counter means to one when the count of the date counter means is changed from 29 to 30, the improvement comprising said year counter means including a year counter adapted to be indexed by a count of one through a counting cycle from zero to nine and thereby produce a year signal representative thereof, and a 10-year counter series connected to said year counter for being cycled at least through one odd and one even counting cycle in response to each return of the count of the year counter to zero, and producing a 10-year signal representative of the count thereof, and judging circuit means for receiving said year counting signal and said 10-year counting signal, and in response to detecting one of the year signals having one of a count of zero, four and eight and said 10-year signal having an even count, and the year signal having one of a count of two and six and the 10-year signal having an odd count, applying a leap year signal to said control means.

4,117,658

WATERPROOF WATCH CASE

Tsutomu Miyasaka; Yoshiaki Fujimori; Shigeru Matsui, and Tetsuo Komaki, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sep. 7, 1976, Ser. No. 721,146
Claims priority, application Japan, Sep. 5, 1975, 50-108435
Int. Cl.[2] G04B *37/08, 39/00*
U.S. Cl. 58—90 R **6 Claims**



1. A waterproof watch case, comprising a watch crystal, a glass bezel surrounding said crystal, said bezel having first and second grooves therein, said first groove facing said watch crystal, first gasket means in said first groove, a glass ring inside said bezel and below said crystal and having a ridge thereon mating with said second groove for pressing said gasket against the periphery of said watch crystal for forming a waterproof seal between said watch crystal and said glass bezel and for locating said watch crystal with respect to said bezel, a case band, fixing means holding said case band to said glass bezel in fixed relationship, a back cover, second gasket means between said back cover and said glass bezel, and biasing means between said case band and said back cover for biasing said back cover axially upward to form a waterproof seal between said back cover and said glass bezel.

4,117,659

DISPLAY CELL

Hiroshi Takeshita, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 5, 1976, Ser. No. 683,444
Claims priority, application Japan, May 7, 1975, 50-55099
Int. Cl.[2] G04C *3/00*; G02F *1/23*
U.S. Cl. 58—23 R **4 Claims**

1. A solution for use in an electrochromic display cell comprising an aqueous solution of a n,n′-diheptyl-4,4′-bipyridinium bromide,

and a buffer means selected from the group consisting of NaOH and potassium primary arsenate; NaCl, glycol and HCl, HCl and sodium secondary citrate; potassium biphthalate; HCl and KCl; HCl and potassium acid phthalate; and NaOH and sodium secondary citrate, to prevent an increase in pH above about 7.2 when said solution is subjected to repeated application of voltage.

4,117,660

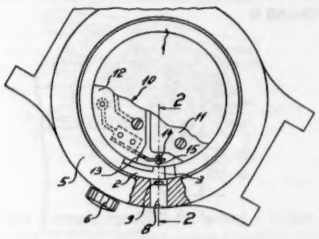
CASING RING FOR WATCH MOVEMENT

Erich Walker, Orvin, Switzerland, assignor to Bulova Watch Company, Inc., Flushing, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,962
Claims priority, application Switzerland, Feb. 12, 1976, 1695/76
Int. Cl.[2] G04B *37/00*
U.S. Cl. 58—23 R **5 Claims**

1. A casing ring formed of synthetic plastic material adapted to encircle a watch movement having an external diameter that is smaller than the internal diameter of a watch case into which the movement is to be fitted, the ring serving to effectively magnify the movement diameter so that it substantially matches that of the case, said case having an actuating member mounted therein which is inwardly movable and is intended to

cooperate within an operating element included in the movement for carrying out an operating function, said member being constituted by a press-button which is biased to normally assume an inactive position, the portion of said ring interposed between said actuating member and said operating element being formed into a swingable intermediate link deflectable by



the press-button when it is actuated to assume an active position to transmit the motion thereof to said operating element, said operating element being constituted by an electrical switch having normally-disengaged contacts, said link having a push pad integral therewith whose position is such that when said link is deflected by the press-button, the pad then pushes said contacts into engagement.

4,117,661

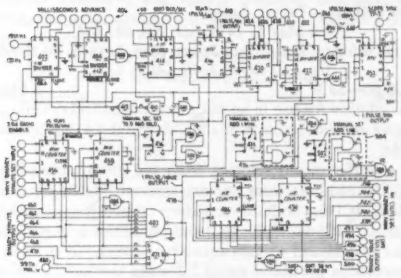
PRECISION AUTOMATIC LOCAL TIME DECODING APPARATUS

Ellis H. Bryant, Jr., 4881 Powers Ferry Rd., NW., Atlanta, Ga. 30327

Continuation of Ser. No. 557,402, Mar. 10, 1975, abandoned, which is a continuation of Ser. No. 406,982, Oct. 16, 1973, abandoned. This application Dec. 14, 1976, Ser. No. 750,431

Int. Cl.[2] G04C *13/02*

U.S. Cl. 58—24 R **24 Claims**



1. Time detecting apparatus, comprising:

means for receiving repetitive binary coded sets of data including time data in a predetermined format;

detecting means for determining from one set of said received data the components thereof representative of time;

storage means for temporarily storing said components;

control means for actuating said detecting means after a preselected time interval to determine from at least one successive set of said received data the components thereof representative of time;

means for updating said stored components by said time interval;

comparison means for comparing the updated stored time components with the time components of said at least one successive set of data;

means responsive to said comparison means for generating signals indicating that said time components from said one set and said at least one successive set of said received data are identical; and

means responsive to said signals to read out said updated stored components from said storage means.

4,117,662

WATCHES

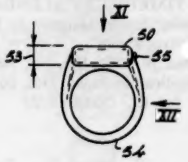
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Nov. 16, 1976, Ser. No. 742,242

Claims priority, application Netherlands, Nov. 17, 1975, 7513381

Int. Cl.[2] G04B *37/12;* **G04C** *19/00*

U.S. Cl. 58—50 R **22 Claims**



1. A watch to be worn on a finger comprising a case, a display face and mechanism for producing images on said display face for viewing by the wearer of the ring mounted on said case, fastening means connected to said case for fastening the watch on a finger, said mechanism including actuating means comprising at least one push button for actuating same whereby an image is produced on said display face, said push button being disposed so that it can be readily operated by one of the other fingers of the same hand.

4,117,663

ELECTRONIC WATCH WITH TIME CORRECTION SYSTEM

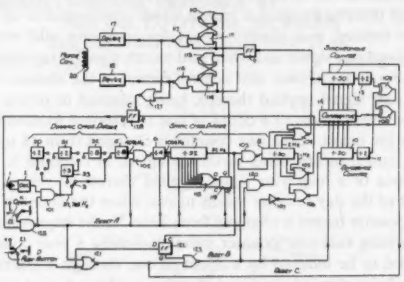
Peter Hubert Mosimann, Bellmund, and Hans Rudolf Sutter, Pieterlen, both of Switzerland, assignors to Bulova Watch Company, Inc., Flushing, N.Y.

Filed Apr. 12, 1977, Ser. No. 786,873

Claims priority, application Switzerland, Apr. 23, 1976, 5101/76

Int. Cl.[2] G04B *27/08*

U.S. Cl. 58—85.5 **15 Claims**



1. An electronic watch wherein high-frequency time base pulses are converted by the stages of a frequency divider into low-frequency pulses which are supplied through a control network to a stepping motor for advancing the hands of the time display, said watch being provided with a system for automatically effecting a rapid correction of the seconds hand display, comprising:

A. an actuating element accessible to the user and operatively coupled to a switch to activate same;

B. means connecting said switch through a reset line to

several of the last stages of said divider to effect a reset thereof when said switch is activated;

C. a resettable reference counter coupled to the output of said frequency divider, said counter being connected to said reset line and being reset when said switch is activated;

D. a synchronous counter;

E. a logic circuit coupling said divider both to said synchronous counter and to the control network for the stepping motor to supply pulses thereto for advancing said display and for maintaining said synchronous counter in synchronism therewith;

F. A comparator circuit coupled to said reference and synchronous counters to determine whether a deviation exists therebetween and the extent of such deviation and to govern the number of pulses per unit of time that said logic circuit supplies to said control network and said synchronous counter to an extent correcting for said deviation, said logic circuit including means causing it to function as decoding logic to define a pulse transfer period which is no longer than the last quarter of the longest duration pulse period of the divider, said logic circuit being so connected to the outputs of the resettable divider stages that the transmission of pulses from the divider to the two counters can only be carried out during said pulse transfer period.

4,117,664

PIVOTING DEVICE FOR A WATCH BARREL

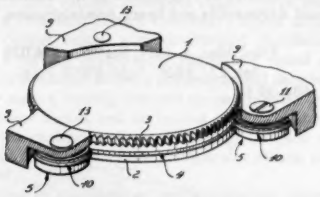
Pierre Mathys, Begnins, Switzerland, assignor to Bouchet-Lassale S.A., Geneva, Switzerland

Filed Feb. 1, 1977, Ser. No. 764,685

Claims priority, application Switzerland, Feb. 18, 1976, 1963/76; Oct. 12, 1976, 12861/76

Int. Cl.[2] G04B *1/16*

U.S. Cl. 58—86 **6 Claims**



1. A watch having a plate, a barrel having a circular periphery, at least three small wheels that are mounted solely on and rotatable relative to said plate, said wheels being spaced about and engaging said periphery to support said barrel on said plate.

4,117,665

MAGNETIC SHIELD PLATE MOUNTING STRUCTURE FOR AN ELECTRONIC TIMEPIECE

Hideyuki Nakao; Yasuhiro Kasai; Yukio Ikehata; Shigeyuki Masuda; Nobuo Obara, and Isamu Nishida, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

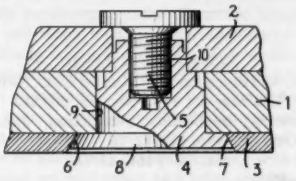
Filed Dec. 23, 1976, Ser. No. 753,848

Claims priority, application Japan, Dec. 26, 1975, 51-178990[U]

Int. Cl.[2] G04B *43/00*

U.S. Cl. 58—106.5 **2 Claims**

1. In a timepiece: a baseplate having a pair of opposed major surfaces and having a bore extending therethrough between said pair of major surfaces; a magnetic shield plate disposed on one of said major surfaces and continuously in contact with said one major surface, said magnetic shield plate having an aperture therethrough aligned with the bore through said baseplate, and the aperture through said magnetic shield plate having a diameter greater than that of the bore and having a periphery defined by a sloped peripheral surface sloped inwardly of the aperture in a direction toward said baseplate; a member of magnetic material disposed on the other of said major surfaces and having a hole therethrough aligned with the aperture through said magnetic shield plate and the bore through said baseplate, and the hole having a diameter smaller than the diameter of the bore through said baseplate; a pin inserted through the aperture through said magnetic shield plate, through the bore through said baseplate and through the hole through said member of magnetic material, said pin including a head portion having a diameter equal to the diameter of the aperture through said shield plate and having a tapered peripheral surface portion complementary to said inwardly sloped peripheral surface of the aperture through said shield plate with said tapered peripheral surface portion of said head portion seated on said inwardly sloped peripheral surface of



the aperture through said shield plate, and said head portion having a thickness less than the thickness of said shield plate so that said head portion of said pin does not protrude above a surface of said shield plate, said pin further including an end portion remote from said head portion and having a diameter effective to permit said end portion of said pin to fit closely within the hole through said member of magnetic material, and said pin further including an intermediate body portion between said head portion and said end portion of said pin and dimensioned to fit closely within the bore through said baseplate; and means having a head greater in diameter than the hole through said member of magnetic material for engaging said pin for fixing said magnetic shield plate, said baseplate and said member of magnetic material together, with said magnetic shield plate continuously in contact with said one major surface of said baseplate to remain undeformed by said head portion of said pin bearing against said shield plate.

4,117,666

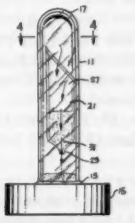
QUICK RESET TIMER

Henry Aguilar, 1309 27th Ave., San Francisco, Calif. 94122

Filed Oct. 3, 1977, Ser. No. 838,852

Int. Cl.[2] G04F *1/06*

U.S. Cl. 58—144 **6 Claims**



1. A quick reset timer comprising,

a greater elongated transparent cylinder of a first inside diameter and a first length, having first and second closed ends,

a lesser, elongated transparent cylinder of a second outside diameter and a second length, both lesser than said first

diameter and first length, and having first and second ends, said first end resembling the pouring spout of a funnel and spaced a first distance from the first end of said greater cylinder, said second end having a chord-wise truncated, sloped, funnel-shaped rim defining a gap between lesser and greater cylinders, said rim being bonded to the inner wall of the greater cylinder at a second distance from the second end of said greater cylinder, and

an amount of fluidic material disposed in said greater cylinder capable of flowing through the first end of said lesser cylinder to collect in the first end of the first cylinder and when inverted capable of flowing through said gap to collect in the second end of the first cylinder, said first and second distances each of a magnitude for defining volumetric regions in said greater cylinder for containing all of said amount of fluidic material exclusive of said lesser cylinder.

4,117,667

SEGMENTED BAND

Willi Tanner, 43 Hirschengraben, Luzern 6000, Switzerland

Filed May 25, 1977, Ser. No. 800,583

Claims priority, application Switzerland, Jun. 2, 1976, 006899/76; Oct. 11, 1976, 012912/76

Int. Cl.[2] F16G *13/18*

U.S. Cl. 59—80 **4 Claims**

1. A segmented band with profile segments the profile surface of which ressembles an equilateral trapezium on the outside and is right angled on the inside, and two adjacent side walls each lying crosswise to the band direction, and two neighbouring profile segments being held together by at least one connecting link in such a way that the profile segments are manoeuvrable along edges lying adjacent to each other, characterized in that the profile segments have a U-profile form the legs of which form said side walls having projecting arms which are equipped with hooks on their ends, and the wall section between the arms is intended to hold the connecting link, in that the connecting link shows a longitudinal groove intended to hold together the side wall sections, lying between the arms, of two neighbouring U-profile segments, in that upper and lower limiting surfaces of the connecting link are slanted to enable the manoeuvrability of the profile segments, and in that closure means are provided to engage in the hooks of the arms which serve to prevent the connecting links from slipping out of the U-profile segments.

4,117,668

STALL DETECTOR FOR GAS TURBINE ENGINE

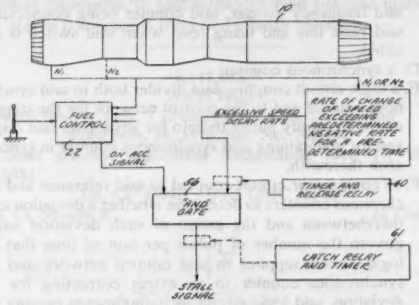
Fred L. Elsaesser, Glastonbury, and Joseph H. Hall, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 19, 1975, Ser. No. 633,310

Int. Cl.[2] F02C *7/22*

U.S. Cl. 60—39.03 **28 Claims**

1. Stall detector for a gas turbine engine having a compressor, burner and turbine, in combination with a fuel control having a fuel metering valve regulating the flow of fuel to the burner and independent coordinating means providing an acceleration schedule limiting said fuel metering valve, said stall detector including means responsive to said acceleration schedule for producing a first signal whenever said fuel control is on or near the acceleration schedule, means responsive to the rate of change of speed of said compressor for producing a second signal when the rate of speed decay exceeds a predetermined value and means responsive to both said first signal and said second signal for producing a third signal indicative of



stall solely when said first signal and said second signal are received.

4,117,669

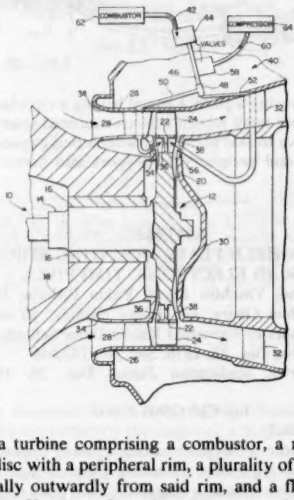
APPARATUS AND METHOD FOR REDUCING THERMAL STRESS IN A TURBINE ROTOR

Jack A. Heller, Shaker Heights, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 4, 1977, Ser. No. 776,029

Int. Cl.[2] F02C *7/26*; F01B *5/18*

U.S. Cl. 60—39.14 **12 Claims**

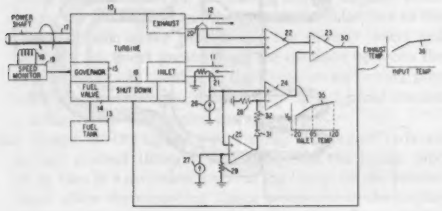


1. In a turbine comprising a combustor, a rotor having a central disc with a peripheral rim, a plurality of blades extending radially outwardly from said rim, and a flow path for a main flow of hot gases from the combustor to the turbine rotor, the improvement comprising: a duct arrangement bypassing said flow path and in fluid communication with said combustor for directing hot gases from said combustor to the under side of the rim of the rotor during turbine start up.

4,117,670
DUAL SLOPE TEMPERATURE DIFFERENTIAL SHUTDOWN CONTROL FOR GAS TURBINES

Walter Stephen Dombkowsi, Long Valley, and Erwin August Rosin, West Caldwell, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1976, Ser. No. 753,714
Int. Cl.[2] F02C *9/08*
U.S. Cl. 60—39.28 T **9 Claims**



1. A temperature differential responsive control circuit comprising,

first sensor means for deriving a signal responsive to a first temperature level,

second sensor means for deriving a signal responsive to a second temperature level,

temperature responsive signal generation means coupled to said second sensor means and including means for controlling a temperature responsive signal amplitude function comprising threshold responsive means having an input coupled to said second sensor means and a variable reference signal source means responding to a signal output of said threshold responsive means and coupled to an input of said temperature responsive signal generation means, said temperature responsive signal generation means responding to said variable reference signal source means to establish a first temperature responsive signal amplitude function output below a predetermined threshold and establish a second temperature responsive signal amplitude function output above a predetermined threshold,

comparator means, having first and second inputs,

said first sensor means and an output of said temperature responsive signal generation means being coupled to said first and second inputs of said comparator means, respectively, and

means coupled to an output of said comparator means for responding to a predetermined temperature differential as defined by said comparator.

4,117,671
NOISE SUPPRESSING EXHAUST MIXER ASSEMBLY FOR DUCTED-FAN, TURBOJET ENGINE

Brian Neal, Seattle, and Lars Q. Andersen, Bothell, both of Wash., assignors to The Boeing Company, Seattle, Wash.

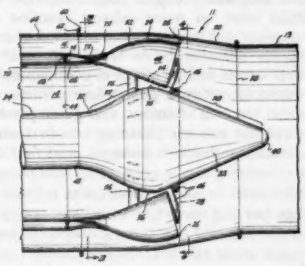
Filed Dec. 30, 1976, Ser. No. 755,837
Int. Cl.[2] F02K *1/26, 3/04*
U.S. Cl. 60—262 **8 Claims**

1. A mixer assembly for suppressing noise emanating from the exhaust of a ducted-fan turbojet propulsion engine of the type having an exhaust end for receiving said assembly which defines an annular turbine outlet and an annular fan duct outlet, said fan duct outlet coaxially surrounding said turbine outlet, and said assembly comprising:

a sleeve, a bulb-shaped plug having an axis of symmetry and being disposed coaxially within said sleeve so that the exterior surface of said plug is spaced radially inwardly from the interior surface of said sleeve, a mixer duct of generally annular shape disposed coaxially between said plug and said sleeve, and said sleeve, plug and mixer duct having concentric, radially spaced apart forward ends adapted for attachment to the exhaust end of the engine so that said plug and said mixer duct define therebetween a rearward extension of said turbine outlet and such that said mixer duct and said sleeve define therebetween a rearward extension of said fan duct outlet;

said plug having a neck portion at its forward end and having a circular cross section that varies in diameter along the axis of said plug between said neck portion and a rear end of said plug, said circular cross section first increasing in diameter to the rear of said neck portion to form a radially outwardly flared offset portion that diverges rearwardly and terminates at a circular cross section of maximum diameter, said circular cross section thereafter decreasing in diameter to form an aft tapered portion that converges radially inwardly and rearwardly and terminates at said rear end of said plug;

said mixer duct being formed with corrugations that are oriented parallel to the axis of said duct, said corrugations commencing at the forward end of said mixer duct and generally increasing in radial dimension toward the rear end of said mixer duct, said corrugations of said mixer duct defining first and second sets of channels, the first set of channels being defined between mutually opposed surfaces of said mixer duct and said plug and said second set of channels being defined between mutually opposed surfaces of said mixer duct and said sleeve, and channels of said first set alternating circumferentially with channels of said second set, said mixer duct being sized and arranged relative to said plug such that said first set of channels are



in radial registration with said offset portion of said plug and such that the radially outermost boundaries of said first set of channels diverge radially outwardly and rearwardly substantially matching the rearward divergence of said offset portion of said plug such that said first set of channels redirects primary flow from the turbine outlet causing such flow to diverge radially outwardly and rearwardly, said mixer duct being sized and arranged relative to said sleeve such that the radially innermost boundaries of said mixer duct that define said second set of channels slope radially inwardly and rearwardly at a slope that generally matches an angle of convergence of the tapered portion of said plug, said second set of channels redirecting the fan flow to cause it to converge radially inwardly and rearwardly and to intersect with the primary flow at an angle of intersection that substantially equals the sum of the angle of divergence of the primary flow and of the angle of convergence of the fan flow, and said radially innermost boundaries of the mixer duct that define said second set of channels being generally aligned with the tapered portion of said plug so that fan flow exiting from said second set of channels flows along said tapered portion of said plug and thereby inhibits the formation of pressure voids along said tapered portion of said plug due to a tendency for the primary flow to separate from the surface of said plug as the primary flow passes across the maximum diameter cross section of the plug.

4,117,672

EXHAUST REACTION CHAMBER SYSTEM OF ENGINE

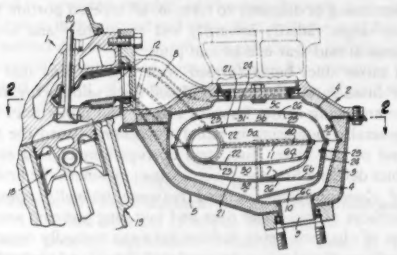
Shuichi Yamazaki, Kamifukuoka; Ikuo Kajitani, Niiza, and Yasuo Kosato, Ooimachi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1976, Ser. No. 712,348

Claims priority, application Japan, Aug. 15, 1975, 50/112068[U]; Aug. 15, 1975, 50/112069[U]

Int. Cl.[2] F01N *3/10*

U.S. Cl. 60—282 9 Claims



1. In an engine exhaust reaction chamber system including an exhaust manifold having an inlet and an outlet, the improvement comprising: an inner exhaust reaction chamber having an outlet and inlet, said inlet being in communication with said exhaust manifold inlet; an outer exhaust reaction chamber annularly enveloping said inner exhaust reaction chamber and having an inlet in communication with said inner exhaust reaction chamber outlet and an outlet in communication with said exhaust manifold outlet; a guide plate positioned within said outer exhaust reaction chamber, said guide plate separating said outer exhaust reaction chamber into first and second outer exhaust reaction chamber passages, said first outer exhaust reaction chamber passage connecting said outer exhaust reaction chamber inlet to said second outer exhaust reaction chamber passage and said second outer exhaust reaction chamber passage connecting said first outer exhaust reaction chamber passage to said outer exhaust reaction chamber outlet; and a partition plate means positioned within said outer exhaust reaction chamber for preventing flow bypass between said inner exhaust reaction chamber outlet and said outer exhaust reaction chamber outlet, whereby exhaust manifold gases are forced to pass in the same direction through the annular space within said outer exhaust reaction chamber prior to exiting said exhaust manifold.

4,117,673

EXHAUST REACTION ASSEMBLY FOR INTERNAL COMBUSTION ENGINE

Shuichi Yamazaki, Kamifukuoka, and Ikuo Kajitani, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

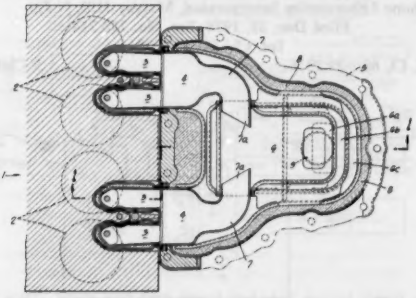
Filed Aug. 30, 1976, Ser. No. 718,676

Claims priority, application Japan, Sep. 4, 1975, 50-106493

Int. Cl.[2] F01N *3/10*

U.S. Cl. 60—282 8 Claims

1. An exhaust reaction chamber assembly for a multi-cylinder internal combustion engine having at least four exhaust ports spaced to form two groups, comprising, in combination: an exhaust manifold having walls forming two preliminary reaction chambers each adapted to receive exhaust gases from one of said groups of exhaust ports, respectively, the exhaust manifold also having walls forming a main reaction chamber, said main reaction chamber being elongated in a first direction, walls forming a first passage connecting one of said preliminary reaction chambers to said main reaction chamber, walls forming a second passage connecting the other of said preliminary reaction chambers to said main reaction chamber, said passages having aligned outlets so that exhaust gases from each passage are directed toward the other passage and the discharge ends of said passages being at a first end of said main reaction chamber perpendicular to said first direction to cause



a mixing of gases entering said main reaction chamber and to cause movement of gases in said first direction substantially perpendicular to the flow of gases into said main reaction chamber.

4,117,674

ENGINE AND REACTOR CONNECTION SYSTEM

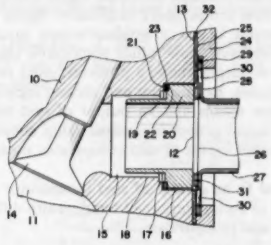
Tomoo Tadokoro, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Japan

Filed Sep. 8, 1976, Ser. No. 721,546

Claims priority, application Japan, Sep. 25, 1975, 50-131672[U]

Int. Cl.[2] F01N *3/10*

U.S. Cl. 60—282 32 Claims



1. A system for connecting a thermal reactor to an internal combustion engine, said thermal reactor including outer and inner casings, said inner casing defining therein a reaction chamber and said outer casing surrounding the inner casing and having at least one mounting flange through which the thermal reactor is operatively coupled to the internal combustion engine, said outer casing further having a first flat, planar surface in which an intake port is defined in communication with the reaction chamber, said combustion engine including an engine casing having at least one combustion chamber defined therein, said engine casing further having a second flat, planar surface in which an exhaust port is defined in communication with the combustion chamber, said connecting system comprising, in combination:

an exhaust passage defining portion of the engine casing having an exhaust passage defined therein and having one end radially outwardly enlarged to provide a larger diameter portion and the other end in communication with the combustion chamber;

a tubular insert having on one end a radially outwardly extending flange and loosely inserted within the exhaust passage with said flange on said tubular insert situated

within the large diameter portion, and the other end facing the combustion chamber, the opening at said one end of the tubular insert constituting said exhaust port;

an intake pipe having one end opening into the reaction chamber through the inner casing and the other end having a radially outwardly extending flange, said flange on said intake pipe having an outer peripheral portion engaged with the mounting flange;

a connecting member in position between one of the opposed annular faces of the flange on the tubular insert facing the intake pipe and the opposed annular face of the flange on the intake pipe facing the tubular insert and having a thickness greater than the distance between the engine casing and the face of the flange on said intake pipe which faces said engine casing when said thermal reactor is mounted on said engine casing;

said flange on the intake pipe having an area of reduced surface contact thereon, said flange on the intake pipe being bent in a direction towards the flange on the tubular insert when the mounting flange is secured to the engine casing by the outer peripheral portion of the flange on the intake pipe being pressed towards the second planar surface surrounding the exhaust port for generating a resilient force; and

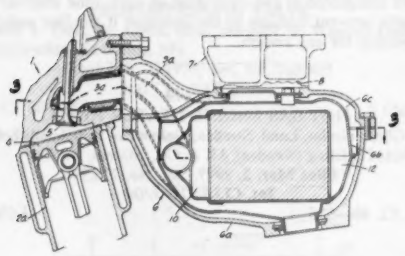
said connecting member, when said mounting flange is secured to the engine casing, receiving said resilient force and transmitting it to said tubular insert for fixing said tubular insert and said intake pipe in position in said exhaust passage and said intake port.

4,117,675

EXHAUST PURIFYING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Minoru Tanaka, Choufu; Ikuo Kajitani, Niiza, and Hidenobu Nagase, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1976, Ser. No. 712,346
Claims priority, application Japan, Aug. 11, 1975, 50-96662
Int. Cl.[2] F01N *3/15*
U.S. Cl. 60—302 **1 Claim**



1. Apparatus for purifying the exhaust gases from a multicylinder internal combustion engine operating on an intake mixture leaner than stoichiometric, the engine having multiple pairs of adjacent exhaust ports of successive firing order, comprising:

an exhaust manifold comprising an induction pipe extending from one pair of exhaust ports to an adjacent pair and having enlarged end portions each arranged to receive exhaust gases directly from a pair of adjacent exhaust ports, said enlarged end portions defining first preliminary reaction chambers;

said induction pipe having an outlet opening between its ends;

means forming a second reaction chamber communicating with said outlet opening;

a first liner forming a catalytic reaction chamber having an entrance opening communicating with said second reaction chamber and containing oxidative catalysts of base metals, and a discharge opening;

a second liner of relatively thin walls, enclosing and spaced from said induction pipe, said second reaction chamber and said first liner and defining an oxidative chamber in communication with said discharge opening, said oxidative chamber communicating with an exhaust pipe; and

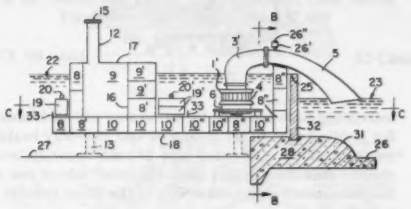
an outer shell of relatively thick walls enclosing and spaced from said second liner.

4,117,676

INCORPORABLE HYDROMOTIVE ASSEMBLY

Francisco José Gutierrez Atencio, Diamante 3105, Entre Rios, Argentina

Filed Aug. 25, 1976, Ser. No. 717,515
Claims priority, application Argentina, Sep. 3, 1975, 260247
Int. Cl.[2] F16D *33/00*
U.S. Cl. 60—327 **10 Claims**



1. An incorporable hydromotive assembly for an energy storing dam having means for retaining water behind it, said assembly including, a water conduit having a lateral wall defining a first open end and a second open end, said conduit provided with an ascending branch having said first open end and joined with a descending branch having said second open end, energy generation means disposed adjacent said ascending branch open end and adapted for actuation as water is directed through said conduit into said first open end and out through said second end and at least one chamber structurally fixed relative said assembly and of a volume at least sufficient to provide floatation and sinking of said assembly when said chamber is filled with gas or liquid, respectively, to position said assembly adjacent said water retaining means with said conduit archingly disposed over said water retaining means.

4,117,677

STATOR FOR A TORQUE CONVERTER

Noboru Murakami, Nagoya, and Choji Furusawa, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 9, 1977, Ser. No. 767,190
Claims priority, application Japan, Feb. 16, 1976, 51/15555
Int. Cl.[2] F16D *33/00*
U.S. Cl. 60—345 **3 Claims**

1. A stator assembly for a torque converter comprising

a stator shaft,

a stator wheel concentrically located relative to said stator shaft,

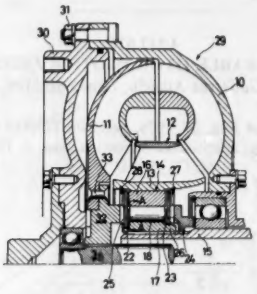
a one-way brake interposed between said stator shaft and said stator wheel including an outer race secured to the inner circumference of said stator wheel, an inner race secured to said stator shaft and roller means interposed between said inner race and said outer race for connecting said stator wheel to said stator shaft, said inner race including an axially extending boss,

washers mounted on said boss with a clearance gap and a pair of thrust disposed between said stator wheel and said stator shaft on opposite side of said one-way brake with the outer circumferences of said thrust washers being

sufficiently spaced at all times from the inner surface of said stator wheel,

a pair of snap rings secured to said stator wheel on opposite side of said thrust washers at a distance from said one-way brake greater than the thickness of a respective thrust washer for locating said thrust washers adjacent said one-way brake, and

a pair of annular plate means mounted on said base and



interposed between each thrust washer and said inner race for holding said roller means of said one-way brake, the axial length of said outer race of said one-way brake is shorter than the distance from the outer side of one annular plate means to the outer side of the other annular plate means,

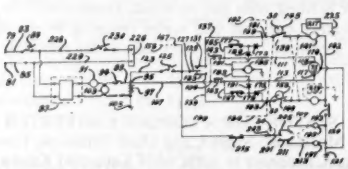
whereby an axially directed thrust force against said thrust washers is transmitted through said plate means only to said inner race of said one-way brake.

4,117,678

SELF-CONTAINED HYDRAULIC SWITCH OPERATOR

John L. Turner, and Fred L. Diener, both of Fairview Heights, Ill., assignors to Turner Electric Corporation, East St. Louis, Ill.

Filed Nov. 8, 1976, Ser. No. 739,473
Int. Cl.[2] F16D *31/02*
U.S. Cl. 60—369 **12 Claims**



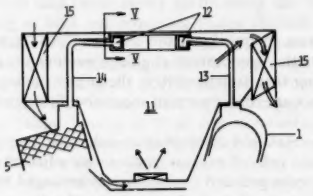
1. A self-contained power operator powered from an external alternating current electrical power source for opening and closing an electric power line switch, comprising a reversible hydraulic rotary actuator, means for mechanically connecting said actuator to the line switch to produce rotary directional movements of the line switch corresponding to rotary directional movements of the actuator, a reversible hydraulic pump having separate outlet ports, separate means hydraulically connecting said outlet ports to opposite sides of said actuator, each of said hydraulic connecting means comprising a single conduit connected at its opposite ends to one of said pump outlet ports and to the corresponding side of said actuator, a reversible direct current electric motor drivingly coupled to said pump for driving the same selectively in opposite directions to produce respectively switch opening and closing directional rotary movements of said actuator, permanent means for electrical connection to an external alternating current electrical power source, an electric storage battery, a battery charger including a rectifier fed by said external alternating current power source connection means and permanently connected to said storage battery to maintain the same in charged condition, separate normally open power circuits connecting said storage battery to opposite poles of said motor for respectively energizing said motor for rotation in opposite directions, separate control circuits for selectively closing said power circuits to cause said motor to rotate in opposite directions, means for selectively energizing the respective control circuit, each said control circuit consisting solely of a limit switch and a relay coil in series, the limit switch in one of said control circuits being closed responsive to full closure of the line switch and opened when the line switch is open, the limit switch in the other of said control circuits being opened responsive to fully closure of the line switch and closed when the line switch is open, each said power circuit having a normally open switch consisting of a contactor of the relay coil in the corresponding control circuit closeable by energization of the latter whereby to energize the motor in the selected direction, a holding circuit connecting each said power circuit to the corresponding control circuit to maintain the latter energized throughout the full respective opening or closing movement of the line switch, said holding circuit including a normally closed switch consisting of a contactor of the relay coil in the opposite control circuit and openable when the opposite control circuit is energized to open said holding circuit switch and prevent energization of the corresponding control circuit and initiation of movements of the line switch in either direction during energization of the opposite control circuit and movements of the line switch in the other direction, each control circuit having a terminal intermediate the connection to the control circuit of the corresponding hold circuit and the limit switch in the control circuit for conductive attachment of remote control equipment, whereby to permit initial energization of the respective control circuits from remote locations, both said control circuits having a ground line with a normally closed switch therein, a time delay relay coil energizable by said control circuits and having a contactor forming the normally closed switch in said ground line, said time delay relay coil being constructed and arranged to open its contactor a predetermined short interval after its energization from either of said hold circuits, whereby to open said control circuits if the respective opening or closing operation of the line switch is not completed at the expiration of such time interval and thereby prevent damage to the operator if the line switch is inoperable for any reason.

4,117,679

HOT GAS ENGINE HEATER HEAD

Per Göran Grahn, Lund, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Filed Mar. 2, 1977, Ser. No. 773,798
Int. Cl.[2] F02G *1/04*
U.S. Cl. 60—525 **4 Claims**



1. A hot gas engine heater head comprising in combination, a set of cylinders and regenerators positioned about an axis, a combustion chamber surrounding said axis with a predetermined internal diameter, heat exchange tubes connecting said cylinders and regenerators extending upwardly into said combustion chamber and inwardly toward said axis, and a set of manifold segments coupling together the respective heat ex-

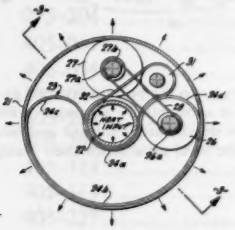
change tubes connecting said cylinders and regenerators forming a ring about said axis of a diameter substantially smaller than that of said combustion chamber.

4,117,680

CONTINUOUS LOOP SHAPE MEMORY EFFECT HEAT ENGINE

Ronald H. Smith, San Francisco, Calif., assignor to Solergy, Inc., San Francisco, Calif.

Filed Dec. 7, 1976, Ser. No. 748,312
Int. Cl.[2] F03G *7/06*
U.S. Cl. 60—527 **4 Claims**



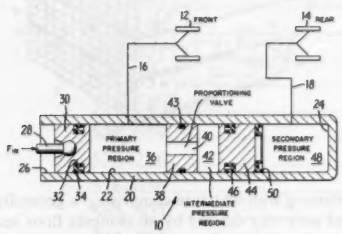
1. In a thermal engine: first and second relatively rotatable bodies having circular external and internal contours, respectively, said first body being positioned within said second body, a band of thermally responsive shape memory material constrained between the first and second bodies and tending to return generally to the internal contour of the second body when heated above a predetermined temperature, means for applying heat energy to the first body, and a flexible band of thermally conductive material trained about the first body and engaging a portion of the band of shape memory material between the first and second bodies for transferring heat energy from the first body to the band of shape memory material.

4,117,681

TANDEM MASTER CYLINDER WITH INTEGRAL PROPORTIONING VALVE

Edward J. Falk, St. Louis, Mo., assignor to Wagner Electric Corporation, St. Louis, Mo.

Filed Feb. 7, 1977, Ser. No. 765,885
Int. Cl.[2] B60T *11/20*
U.S. Cl. 60—562 **8 Claims**



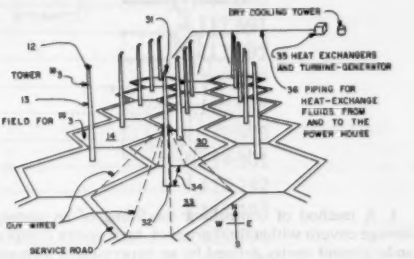
1. In a fluid brake system the improvement comprising:
(a) a tandem brake master cylinder having;
(b) a first, a second and an intermediate pressure region;
(c) first conduit means for supplying fluid pressure from said first pressure region of the cylinder to a first set of brakes, said first conduit means providing a continuously open fluid communication between said first pressure region and said first set of brakes;
(d) first piston means movable in said first pressure region of the cylinder for generating fluid pressure therein;
(e) second conduit means for supplying fluid pressure from said second pressure region of the cylinder to a second set of brakes;
(f) second piston means movable in said second region of the cylinder for generating fluid pressure therein on a first side of said second piston means;
(g) proportioning valve means positioned between said first pressure region and a second side of said second piston means and forming between itself and said second side of said second piston means said intermediate pressure region;
(h) said proportioning valve means at least in part controlling the relationship of fluid pressure in said first and intermediate pressure regions; and
(i) the fluid pressure in said intermediate region urging said second piston means toward a position for generating fluid pressure in said second pressure region.

4,117,682

SOLAR COLLECTOR SYSTEM

Otto J. M. Smith, 612 Euclid Ave., Berkeley, Calif. 94708

Filed Nov. 1, 1976, Ser. No. 737,489
Int. Cl.[2] F03G *7/02*
U.S. Cl. 60—641 **52 Claims**



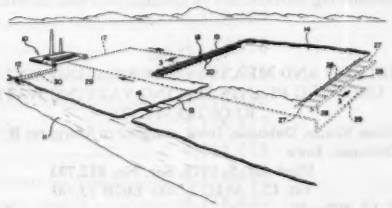
1. A solar collector system comprising: a plurality of solar receptors supported on towers; a plurality of heliostatic mirrors, a predetermined plurality of such mirrors laid out in a geometric pattern forming a field module with a unique associated tower on which such field module concentrates solar energy, each of said field modules being substantially contiguous to one another and interlocked, said unique tower being located outside of its associated field module.

4,117,683

SYSTEM AND METHOD FOR COOLING HOT WATER FROM INDUSTRIAL PLANT COOLING USE

Ross H. Rasmussen, R.F.D. #2, Hooper, Nebr. 68031

Filed Jan. 24, 1977, Ser. No. 762,205
Int. Cl.[2] E02B *3/00*
U.S. Cl. 405—61 **27 Claims**



1. A system for thermal disposal and port improvement comprising:
an industrial plant constituting a source of hot cooling water which must be cooled located along a navigable river, lake or ocean,

a body of water, constituting a port in the vicinity of the industrial plant, separate from but in navigable communication with the river, lake or ocean,

means for delivering hot cooling water from the industrial plant to the port water to cool the water throughout the year and to prevent it from freezing shut in winter, and

means for removing cool cooling water from the port water and delivering it to the industrial plant and/or to a river, lake or ocean.

4,117,684

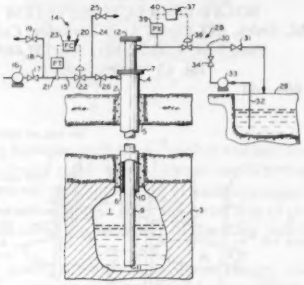
UNDERGROUND STORAGE

Hurshel V. Hendrix, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 16, 1977, Ser. No. 797,211

Int. Cl.[2] E21F *17/16*

U.S. Cl. 405—54 **16 Claims**



1. A method of controlling the filling of an underground storage cavern with a fluid product, said cavern comprising an underground cavity defined by an impermeable formation and an access bore defined by a surface and extending from said cavity to the ground surface, said cavern normally containing a displacing liquid heavier than and immiscible with said product with an interface formed therebetween, said cavern being provided with a conduit extending into said cavity and communicating with said cavity at its lower end, the lower end of said conduit being adjacent the bottom of said cavern at a point normally below said interface, said method comprising the steps of:

introducing said product into said cavern via said access bore so as to displace a portion of said liquid from said cavern;

discharging the displaced portion of the liquid from said cavern via said conduit;

continuously measuring, at a point in said conduit adjacent the ground surface, the static pressure in said conduit;

terminating the discharge of fluid through the conduit when said pressure reaches a predetermined level indicating presence of said product in said conduit; and

terminating introduction of product into said cavern.

4,117,685

METHOD AND MEANS FOR IRRIGATING SOIL AND GROWING PLANTS HAVING VARYING WATER REQUIREMENTS

William Skaife, Dubuque, Iowa, assignor to Margaret R. Skaife, Dubuque, Iowa

Filed Jul. 5, 1977, Ser. No. 812,793

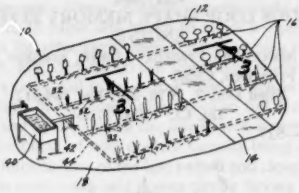
Int. Cl.[2] A01G *27/00;* **E02B** *13/00*

U.S. Cl. 405—36 **8 Claims**

1. A method of irrigating soil and growing plants having varying water requirements including the steps of,

providing a growing medium having top and bottom layers with the top layer being soil and the bottom layer being a material having substantially greater water holding and retention characteristics than said top layer of soil thereby substantially restricting the transmission of water from said bottom layer to said top layer by capillary action,

insulating the bottom layer from soil to the sides and therebelow, and



supplying water to the bottom layer of growing medium to maintain it substantially saturated whereby plant roots may grow downwardly toward and into said lowermost layer to the level suitable for their water requirements.

4,117,686

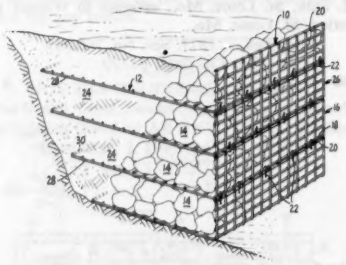
FABRIC STRUCTURES FOR EARTH RETAINING WALLS

William K. Hilfiker, Eureka, Calif., assignor to Hilfiker Pipe Co., Eureka, Calif.

Continuation-in-part of Ser. No. 724,267, Sep. 17, 1976, abandoned. This application Nov. 16, 1977, Ser. No. 852,190

Int. Cl.[2] E02D *5/00*

U.S. Cl. 405—284 **12 Claims**



1. A retaining wall structure comprising: a generally rectangular steel wire tray defined by an elongate floor section extending over the length of the tray and a face section of a depth less than the length of the floor section extending at an angle relative to the floor section, said tray having longitudinal rods extending continuously over the length thereof and across said floor and face sections in spaced, generally parallel relationship to one another and cross-rods welded to and extending transversely across said longitudinal rods in spaced relationship to one another; and, a mat overlaying the face section to the side thereof from which the floor section extends, said mat being generally coextensive with the face section and fabricated of a water-permeable material of sufficient density to prevent the substantial erosion of soil therethrough.

PATENTS

GRANTED OCT. 3, 1978

ERRATA

For CLASS	See PATENT NO.
075–204	4,117,565
405–061	4,117,683
405–054	4,117,684
405–036	4,117,685
405–284	4,117,686
405–292	4,117,687
405–188	4,117,688
405–163	4,117,689
405–227	4,117,690
405–205	4,117,691
405–166	4,117,692
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280–255	4,117,915
235–061	4,117,973
308–006 C	4,118,101
424–012	4,118,192
422–094	4,118,193
422–098	4,118,194
222–215	4,118,195
422–232	4,118,196
422–246	4,118,197
422–173	4,118,198
422–171	4,118,199
062–176 D	4,118,209
055–279	4,118,226
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560–078	4,118,313
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528–190	4,118,372
528–073	4,118,373
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526–036	4,118,378
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562–503	4,118,416
562–401	4,118,417
562–439	4,118,418
562–534	4,118,419
562–583	4,118,420
568–767	4,118,586
350–096.23	4,118,594
325–026	4,118,598
040–361	4,118,654
222–003	4,118,691

4,117,687

MINE ROOF SUPPORTS

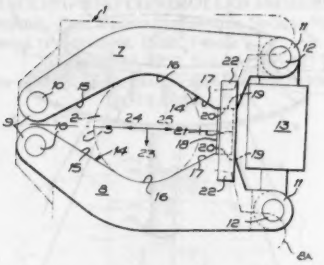
Arthur Scarfe, and John Cambridge Smith, both of Wakefield, England, assignors to Fletcher Sutcliffe Wild Limited, Wakefield, England

Filed Dec. 20, 1977, Ser. No. 862,385

Claims priority, application United Kingdom, Dec. 29, 1976, 54266/76

Int. Cl.[2] E21D *15/44*

U.S. Cl. 405—292 **10 Claims**



1. A mine roof support comprising a roof beam, a base member, at least one hydraulically extensible chock leg connected at an upper end thereof in articulated manner to said roof beam, and connected at a lower end thereof in articulated manner to said base member, a pair of links each having bearing surfaces embracing a common chock leg by bearing on opposite sides thereof, one end of each said links being pivotally attached to said base member at a pivot point located to one side of a diametral plane passing through the longitudinal axis of said chock leg, the other end of each of said links being located to the other side of said diametral plane, a restoring ram acting upon said other ends of said links and adapted to displace at least one of said links about said pivot point, to restore said leg to its predetermined position upon release of said support from a mine roof, and also to resist tendency for said leg to become displaced from said predetermined position whilst said support is engaged with said mine roof, and stop means also mounted on said base member and engageable by at least one of said other ends of said links end to determine the maximum displacement of at least one of said other ends of said links by said restoring ram.

4,117,688

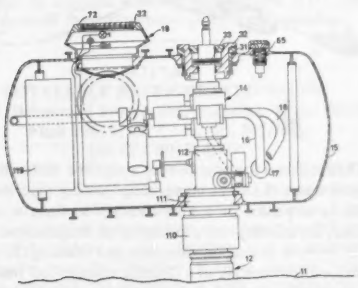
APPARATUS FOR WORKING UNDER WATER

Kenneth Ball, Liverpool, England, assignor to Vickers-Intertek Limited, London, England

Division of Ser. No. 456,769, Apr. 1, 1974, Pat. No. 3,968,656. This application May 12, 1976, Ser. No. 685,676

Int. Cl.[2] B63C *11/00*

U.S. Cl. 405—188 **5 Claims**



1. A sub-sea capsule comprising a hollow body which is adapted in its position of use to surround a sub-sea installation and be at all times water filled with the pressure of water in said capsule varying between pressure equal to external sea pressure and substantially atmospheric pressure depending on whether the interior of said sub-sea capsule is exposed to external sea pressure or to substantially atmospheric pressure of a transit capsule connected to said sub-sea capsule, said sub-sea capsule being resistant to external sea pressure when the pressure of water filling said capsule is at substantially atmospheric, means associated with said capsule permitting mounting thereof in sealed relationship around an installation, means carried by said capsule for cooperation with complementary means on a transit capsule to form access means between said sub-sea capsule and said transit capsule, and leak detection means located within the upper part of said capsule for detecting any leakage floating up from an installation through water filling said capsule when the latter is in its position of use surrounding said installation.

4,117,689

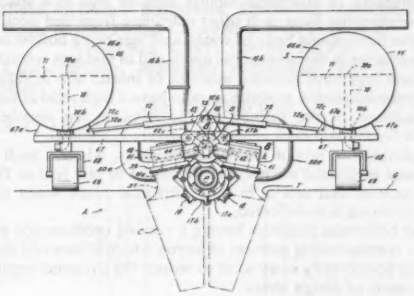
SUBMARINE PIPE TRENCHING APPARATUS

Charles Francis Martin, P.O. Box 197, Porter, Tex. 77365

Continuation-in-part of Ser. No. 211,386, Dec. 23, 1971, Pat. No. 4,022,028. This application May 9, 1977, Ser. No. 795,026

Int. Cl.[2] E02F *5/08*

U.S. Cl. 405—163 **19 Claims**



1. An underwater trenching apparatus for burying a pipeline or the like beneath the bottom of a body of water comprising:

a frame for positioning over the pipeline to be buried;

jet support means supported on said frame for oscillatory movement with respect to said frame about a first axis generally transverse to said pipeline;

a plurality of nozzles on said jet support means for digging a trench in said bottom for burying said pipeline;

oscillating means operatively connected to said jet support means for oscillating said jet support means with respect to said frame;

a plurality of rollers secured to said apparatus and contacting said pipeline to direct said apparatus along said pipeline;

drive means to drive at least a first of said rollers for movement of said apparatus along said pipeline; and

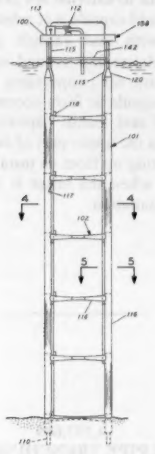
biasing means operative between at least one of said rollers and said frame to permit movement of said roller toward and away from the axis of said pipeline while following variations in the circumference in said pipeline.

4,117,690

COMPLIANT OFFSHORE STRUCTURE

Celestine Paul Besse, New Orleans, La., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 720,035, Sep. 2, 1976. This application Oct. 11, 1977, Ser. No. 840,695
Int. Cl.[2] E02B *17/00*
U.S. Cl. 405—227 **46 Claims**



1. A marine structure for supporting sundry equipment, said structure comprising:

a deck having sufficient stiffness to remain relatively horizontal when said deck sways due to wind and wave forces against said marine structure;

a plurality of elongated tubular support legs in a spaced relationship from each other extending from said deck to the floor of said body of water, said legs being hollow and reducing in diameter at the upper end of said legs whereby said legs have reduced moment of inertia and in turn a reduced section modulus so as to have a high ratio of deck stiffness to the stiffness of the adjacent leg members, whereby said deck remains relatively horizontal;

a plurality of sets of horizontal members, wherein each of said horizontal members is connected to said legs so that each of said sets is in one horizontal plane when said structure is undeflected;

said horizontal members having a varying cross-section and a corresponding moment of inertia which allows said deck to horizontally sway so as to reduce the dynamic amplification of design stress.

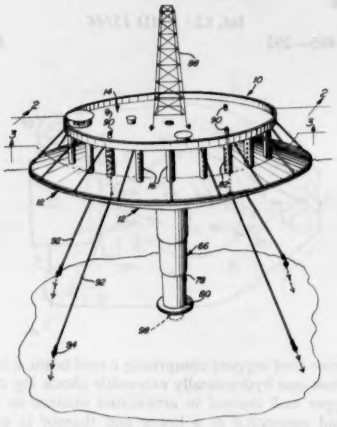
4,117,691

FLOATING OFFSHORE DRILLING PLATFORM

Claude Spray, 6008 Arlington Blvd., Richmond, Calif. 94805

Filed Aug. 11, 1977, Ser. No. 823,855
Int. Cl.[2] E02B *17/00*
U.S. Cl. 405—205 **7 Claims**

1. A floating offshore drilling platform including a hollow generally circular horizontal float body tapering in thickness from its central portion to its outer periphery, said body including upper and lower walls which are inclined downwardly and upwardly, respectively, from said central portion to said outer periphery, a horizontal work platform spaced above said body and supported therefrom by upstanding supports extending and secured between said body and platform at points spaced about said central portion, said body including means defining a central vertical passage therethrough, the interior of said body spaced outwardly of and about said central portion including means defining ballast tanks which may be selectively flooded and evacuated of water, and a central upstanding tubular caisson supported at its upper end from said body about said passage and adapted at its lower end for engagement with the ocean floor, at least the lower end portion of said caisson comprising an extendable and retractable end portion thereof, said retractable end portion including selectively operable flotation means for buoying said lower end portion upwardly toward a retracted position, said flotation means including



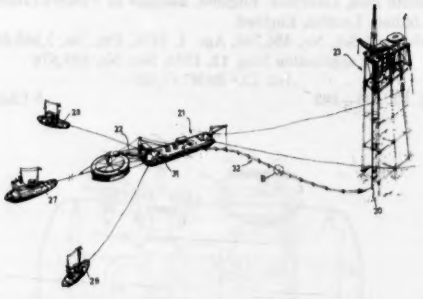
means defining a closed outer flotation chamber supported from said retractable end portion, flexible air conduit means extending downwardly along said caisson and having a lower end opening into said outer flotation chamber, and purge passage means opening inwardly of the lower portion of said outer flotation chamber and outwardly of the latter.

4,117,692

METHOD AND A SYSTEM FOR PRODUCING AND LAYING OIL OR GAS PIPELINES ON THE SEA BOTTOM

Karl Erik Öberg, Förrådsgatan 1, S-171 32 Solna, Sweden

Filed Mar. 21, 1977, Ser. No. 779,546
Claims priority, application Sweden, Mar. 26, 1976, 7603676
Int. Cl.[2] F16L *1/04*
U.S. Cl. 405—166 **8 Claims**



1. In a method for establishing a pipeline on the bottom of a body of water the steps comprising: joining pipe lengths end-to-end in sequence at a first location to form a continuous pipeline; forwarding the pipeline in its longitudinal direction, as it is formed, to a second location and winding the pipeline at the second location on to a floating storage reel maintained in said body of water; moving the floating storage reel through the water to a pipe-layig site; coupling the reel to a floating

pipe-laying vessel at the site while maintaining the reel floating independently of the vessel; unwinding the pipeline from the floating drum and transferring the pipeline in its longitudinal direction, as it is unwound, to the pipe-laying vessel; and feeding the pipeline in its longitudinal direction, as it is received from the floating reel from the pipe-laying vessel to the submerged bottom.

4,117,693

PLACING CONDUITS ON THE SEA FLOOR BY HAULING AND CONTROLLED IMMERSION

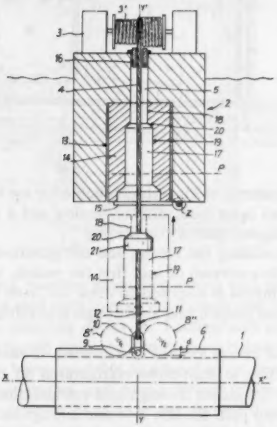
Rene Fournie, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Jun. 10, 1977, Ser. No. 805,427

Claims priority, application France, Jun. 14, 1976, 76 17948

Int. Cl.[2] F16L *1/00*

U.S. Cl. 405—171 **4 Claims**



1. Apparatus for positioning on the sea floor, a pipeline for the transfer of liquid or gaseous fluids, comprising a plurality of lightening and handling devices distributed along the pipeline, each of said handling devices being supported by at least one lightening means comprising a primary float, a coupling means on the pipeline, a cable on the handling means, a pivotal connector connected between the coupling means and the cable, at least one additional lightening means comprising a secondary float, said secondary float having the same axis of symmetry as the handling cable, said coupling means on the pipe presenting a seat, and said secondary float resting on the coupling seat, means releasably connecting the secondary float to the coupling means, said secondary float and primary float comprising male and female engaging sections, so that the secondary float after release from the coupling means of the pipeline, can be engaged with the mating parts of the primary float and secured thereto to provide a single assembly.

4,117,694

ROTATABLE REFRIGERATED VALVE

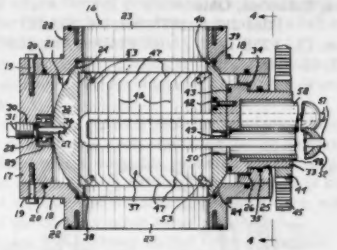
Richard J. Belmore, 2 Francis Dr., Randolph, Mass. 02368

Filed Feb. 9, 1977, Ser. No. 767,158

Int. Cl.[2] B01D *5/00*

U.S. Cl. 62—55.5 **9 Claims**

1. A valve to be installed in vacuum and like pumping systems, said valve including a casing having a chamber, a port of circular cross section opening into the chamber with its axis inclusive of the center of said chamber, and an inlet and an outlet opening into the chamber, a valve element rotatable within the chamber and including a neck extending through said port, sealing means between said casing and said neck, said valve element having a transverse passage disposed to effect connection between said inlet and outlet in a first element position and to block such connection in another position thereof, sealing means between said element and said casing,



and refrigerating means within said passage and supported by said element and operable when connected to a refrigerant source to refrigerate said valve element.

4,117,695

THERMODYNAMIC METHOD AND DEVICE FOR CARRYING OUT THE METHOD

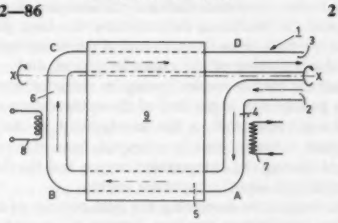
Clifford McDonald Hargreaves, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 5, 1972, Ser. No. 259,915

Claims priority, application Netherlands, Jun. 14, 1971, 7108157

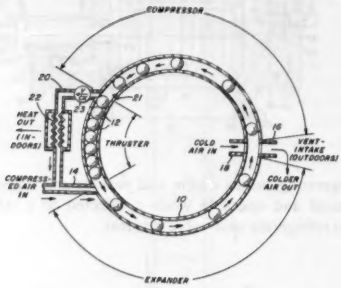
Int. Cl.[2] F25B *9/00*

U.S. Cl. 62—86 **2 Claims**



1. Apparatus for compressing a gas, which comprises a rotor, means for rotating said rotor about its axis, gas inlet means adjacent said axis, separate gas outlet means adjacent said axis, a gas compression duct extending generally radially outwardly from said inlet means, a gas communication duct extending generally axially from said compression duct, a gas expansion duct extending generally radially inwardly from said communication duct to said outlet means, cooling means for removing thermal energy from compressed gas in said compression duct, heating means for supplying sufficient thermal energy to expanded gas in said expansion duct to thereby maintain the temperature of said expanded gas higher than the temperature of the compressed gas in the compression duct, and heat exchanger means for transferring heat from the expanded gas in said outlet means to the compressed gas in said communication duct, whereby gas is pumped from said inlet means to said outlet means by centrifugal force.

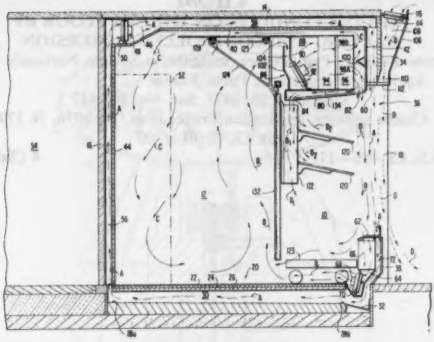
4,117,696
HEAT PUMP
Sherwood L. Fawcett, Columbus, and James N. Anno, Cincinnati, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio
Filed Jul. 5, 1977, Ser. No. 812,559
Int. Cl.[2] F25B *1/00, 13/00;* **F16D** *31/00;* **F01C** *1/00*
U.S. Cl. 62—115 **21 Claims**



1. Heat pump apparatus comprising:
(a) a continuous loop passageway containing a plurality of freely movable, unrestrained bodies,
(b) means for generating a force by isentropic expansion of fluid in an expander region of said passageway to thereby accelerate successive ones of the bodies in one direction around the passageway,
(c) a compression region in the passageway beyond the expander region wherein fluid is isentropically compressed between successive ones of the propelled bodies,
(d) port means in the passageway between the end of the expander region and the beginning of the compression region to permit the venting of fluid which has been expanded and the entrance of fluid which is to be compressed,
(e) a thruster region in the passageway beyond the compression region wherein a force is applied to successive ones of the bodies to counterbalance the external forces acting against the bodies as they traverse the loop passageway and to return them from the end of the compression region to the beginning of the expander region, and
(f) heat exchanger means having its entrance connected to the passageway at the end of the compression region and its exit connected to the passageway in the expander region, wherein heat is extracted from the compressed fluid leaving the compression region and the fluid is then introduced into the expander region.

16. A method for increasing the heat content of a fluid and thereafter transferring the heat content to an ambient atmosphere, which comprises the steps of:
(a) providing a closed-continuous loop passageway containing a plurality of freely movable, unrestrained bodies,
(b) generating a force between successive ones of said bodies by isentropic expansion of fluid in an expander region of said passageway to increase the kinetic energy of the bodies and thereby propel successive ones of the bodies in one direction around the passageway,
(c) exiting said fluid after isentropic expansion thereof from the interior of said passageway at a reduced temperature,
(d) introducing a fluid at a temperature higher than said reduced temperature into the interior of said passageway and thereafter compressing said introduced fluid between successive ones of the bodies propelled by isentropic expansion, and
(e) thereafter passing the compressed fluid through heat exchanger means connected to the passageway at the completion of compression of said fluid for extracting heat from the fluid thus compressed.

4,117,697
ROLL-IN OPEN-FRONT FROZEN FOOD REFRIGERATION CASE
James E. Myers, and Tom E. Kennedy, both of Niles, Mich., assignors to Tyler Refrigeration Corporation, Niles, Mich.
Filed Jan. 31, 1977, Ser. No. 764,157
Int. Cl.[2] A47F *3/04*
U.S. Cl. 62—256 **29 Claims**



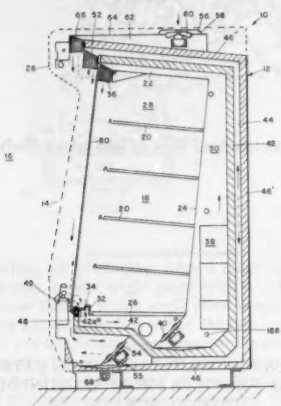
1. In a commercial refrigerator, suitable for use in supermarkets, having an open front display section and a rear storage section, the improvements comprising:
first air circulating fan means, and refrigeration coil means located downstream of said first fan means, wherein said first fan means is disposed to draw air from said storage section and propell said air through said refrigeration coil means;
first conduit means located downstream of said coil means for directing at least some refrigerated air propelled by said first fan means through said refrigeration coil means along a first path directly into said storage section and for directing other of said refrigerated air propelled by said first fan means through said coil means along a second path directly across the open front of said display section to form a relatively inner air curtain;
means for directing the downstream end of said inner air curtain across the front of said display section and into said storage section;
second air circulating fan means; and
further conduit means for directing air propelled by said second fan means around the exterior of said storage and display sections and across said access opening to form a relatively outer air curtain.

4,117,698
REFRIGERATED DISPLAY
Robert E. Vogel, Marshall, Mich., assignor to Kysor Industrial Corporation, Cadillac, Mich.
Filed Jun. 29, 1977, Ser. No. 810,973
Int. Cl.[2] A47F *3/04;* **F25D** *11/00*
U.S. Cl. 62—256 **10 Claims**

10. An open front, multiple curtain refrigerated display case having a top, a bottom, a rear, a front side, and an access opening in said front side communicating a storage and display space within the cabinet with the ambient atmosphere, at least two air outlets, an inner one and an adjacent one, extending across the upper edge of said access opening; and corresponding inner and adjacent air inlets extending across the opposite lower edge of said access opening; an inner conduit extending from said inner inlet, around the bottom, back and top of said cabinet, to said inner outlet; an adjacent conduit extending from said adjacent inlet around said cabinet to said adjacent outlet; a refrigeration coil in said inner conduit; a plurality of refrigerated-air, circulating fans in said inner conduit to propel

refrigerated air from said inner inlet, across said coil, to said inner outlet, and across said access opening to said inner inlet as a refrigerated air curtain; a plurality of guard-air, circulating fans in said adjacent conduit to propel air in said adjacent conduit, to said adjacent outlet, and across said access opening to said adjacent inlet as a guard air curtain parallel to said refrigerated air curtain; the improvement comprising, in combination with the above;

a flexible, retractable, roll-up night curtain having one end mounted between said inner and adjacent inlets and extensible to a position extending across said access opening between said refrigerated air curtain and said guard air curtain; securing means for holding said perforate night curtain in said extended condition; said guard air circulating fans being operable to propel air in one direction for normal operation, and during defrost to propel defrost air in said adjacent conduit in the reverse direction to melt frost and ice from on and about said night curtain when extended, and to flow into said inner inlet for defrosting said coil when said night curtain is not extended.

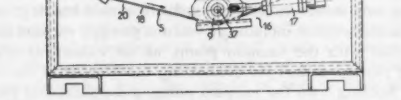


4,117,699

CALENDERS FOR THE THERMAL TREATMENT OF LAMINAR MATERIAL

Henry Renaut, Roubaix, France, assignor to Lemaire & Cie, France

Filed Nov. 23, 1976, Ser. No. 744,262
Claims priority, application France, Feb. 19, 1976, 76 05168
Int. Cl.[2] B41F *3/52*; B65H *5/02*
U.S. Cl: 68—5 D **2 Claims**



1. A calender for thermal treatment of laminar material to transfer a design from a band of inert material to the laminar material, the calender comprising:

a cylindrical, heatable drum rotatably mounted about an axis thereof;

an endless longitudinal belt and "messenger" which comprises a plurality of endless longitudinal bands with longitudinal edges thereof positioned side-by-side and which hugs the drum to force laminar material and a belt of inert material against one another;

means for driving the messenger in translatory movement along its length and for rotatably driving the drum about its axis;

separate regulating devices, each for regulating the tension of one of the bands, each regulating device comprising at least three rollers, rotatably mounted about a single axis parallel to the axis of the drum and disposed in contact, around a portion of the rollers' circumference, with one face of the corresponding band; and

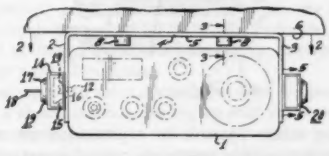
thrust means for applying to the rollers adjustable forces directed towards said face of the band, the thrust means comprising at least two arms fixed relative to the drum's axis at least in the direction of the adjustable force and disposed respectively between two of the rollers.

4,117,700

LOCKING ARRANGEMENT FOR RADIOS OR THE LIKE

Charlie H. Saunders, 167 Highland St., Valparaiso, Fla. 32580

Filed Jan. 18, 1978, Ser. No. 870,293
Int. Cl.[2] E05B *73/00*
U.S. Cl. 70—58 **11 Claims**



1. In a locking device for covering against access the head of a mounting bolt for mounting a CB radio or the like to a mounting bracket, an elongated sleeve having opposite front and back walls and an open end, an elongated bar slideable into said sleeve through said open end, said back wall being provided with a hole proportioned to pass the shank but not the head of such mounting bolt and said front wall being provided with a second hole aligned with said first hole proportioned to pass the head of such mounting bolt, said front wall and said bar comprising wall portions defining a continuous aperture extending through said front wall and into said bar when said bar is in a predetermined position in said sleeve, a lock having a portion disposed removably in said aperture through said front wall and into said bar, said lock comprising means movable with respect to said portion from a locked to an unlocked position cooperative, when in locked position, with said sleeve and bar to retain said portion so disposed in said aperture, said bar comprising a portion which is disposed, when said bar is in said predetermined position within said sleeve, in covering relation to said second hole.

4,117,701

ELECTRO-THERMAL LOCK

Luigi Giovanni Del Mei, 1178 Park St., Pretoria, South Africa

Filed Aug. 11, 1977, Ser. No. 823,642
Claims priority, application South Africa, Jan. 20, 1977, 77/0322; Jun. 17, 1977, 77/3627; Jun. 21, 1977, 77/3693
Int. Cl.[2] E05B *47/06*
U.S. Cl. 70—150 **14 Claims**

1. A locking device comprising:

a latching element movable between a locking position and an inoperative position;

operating means for moving the latching element from the locking position to the inoperative position; and

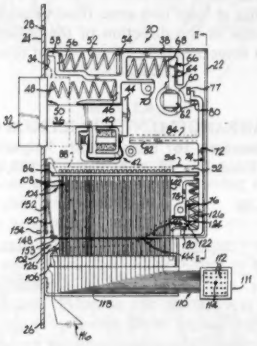
blocking means operable for preventing the operating means from moving the latching element from the locking position to the inoperative position;

wherein the blocking means comprises:

a blocking member movable to a blocking position for mechanically preventing the operating means from moving the latching element from the locking position to the inoperative position;

thermally responsive holding means for adopting a holding condition for temporarily holding the blocking member in the blocking position;

thermo-electric control means for heating said thermally responsive holding means to move said thermally responsive holding means from said holding condition, thereby permitting said blocking member to move from said blocking position;



actuating means operable in a predetermined mode for energising said thermo-electric control means to heat said thermally responsive holding means;

thermally responsive safety means for normally adopting an inoperative condition; and

thermo-electric safety control means for heating said thermally responsive safety means to move said thermally responsive safety means to a holding condition for temporarily holding the blocking member in the blocking position;

said actuating means including switching means for energising the thermo-electric safety control means upon operation of said actuating means in at least one mode other than said predetermined mode.

4,117,702

ROLLING MACHINES FOR CONTOURING TAPERED STRUCTURAL MEMBERS

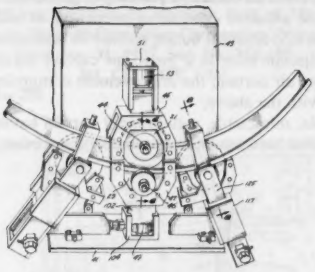
Gene B. Foster, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 6, 1977, Ser. No. 803,683
Int. Cl.[2] B21D *7/08, 7/14*
U.S. Cl. 72—7 **18 Claims**

16. In a rolling machine for contouring elongate parts as said parts are moved past a plurality of contouring rolls, at least one of which is position adjustable along at least one forming axis, the improvement comprising:

fashioning each of said plurality of contouring rolls from at least two segments located side-by-side along the axis of rotation of the related contouring roll, selected ones of said segments being transversely movable with respect to the axis of rotation of the related contouring roll; and,

movement means coupled to predetermined ones of said transversely movable segments of said plurality of contouring rolls for instantaneously controlling the position



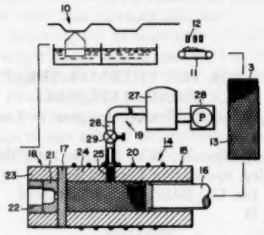
of said predetermined ones of said transversely movable segments.

4,117,703

APPARATUS FOR MANUFACTURING EXTRUDED STRUCTURAL PROFILES FROM ALUMINUM BASED METAL SCRAPS

Toshiro Takahashi; Toshihiro Nagano; Shozo Iguchi, all of Shizuoka; Masaru Kikuchi, Fiji; Katsuhiko Nakamura, Shizuoka, and Atsushi Mochizuki, Shimizu, all of Japan, assignors to Riken Keikinzoku Kogyo Kabushiki Kaisha, Shizuoka, Japan

Division of Ser. No. 585,860, Jun. 11, 1975, Pat. No. 4,050,142.
This application May 31, 1977, Ser. No. 801,910
Claims priority, application Japan, Jun. 14, 1974, 49-67944
Int. Cl.[2] B21C *23/01, 23/04*
U.S. Cl. 72—38 **2 Claims**



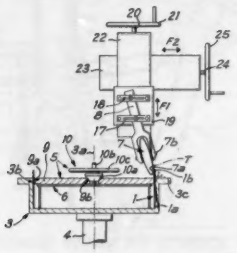
1. Apparatus for producing extruded structural profiles from aluminum based metal scrap materials comprising means defining an extruder housing for receiving the scrap materials to be extruded, means forming a die disposed at one end of said housing means and having an extruding opening, a power operated extruding ram slidably disposed in said extruder housing for applying extruding pressure to the scraps in said housing, and means for exhausting air from said housing, said air exhausting means including a vacuum pump, a vacuum tank connected with the vacuum pump, an air exhausting plate having passage means for connecting the interior of the extruder housing with the vacuum pump, a die slide, said plate being mounted on said die slide together with said die, said die slide being operable to alternately place the air exhausting plate and the die in engagement with the extruding end of the extruder housing.

4,117,704

METHOD AND APPARATUS FOR PRODUCING A BENT ANGLE PIECE FROM A SHEET-METAL

Robert Nakache, Paris, and Christian Lequeux, Thionville, both of France, assignors to Societe Coil Protection Service, Thionville, France

Filed May 13, 1977, Ser. No. 796,656
Int. Cl.[2] B21D *19/04*
U.S. Cl. 72—83 **16 Claims**



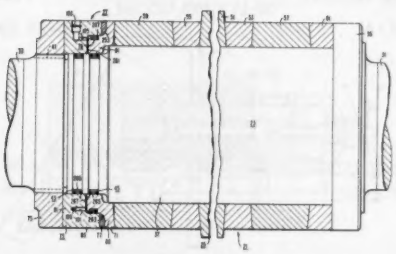
1. A method for producing, from a plane sheet-metal or a plane strip-iron, a bent angle piece with a cylindrical flange and an annular flange, which angle piece is split over its entire length along a generating line so that the two lateral ends of the angle piece can be overlapping, wherein the plane sheet-metal is first shaped into a cylinder split along a generating line so that the ends of the sheet-metal are overlapping, wherein the portion of the sheet-metal cylinder intended to constitute the cylindrical flange of the angle piece is clamped on a support such as a mandrel moving in rotation about the axis of the cylinder, and wherein whilst the support is rotating, successive areas adjacent the unclamped end portion of the sheet-metal cylinder are progressively bent by a thrusting operation until said unclamped end portion occupies a position which is at least nearly perpendicular to the axis of the cylindrical part.

4,117,705

WORK REDUCING AND PRESSURE APPLYING

Martin J. Dempsey, Bethel Park, Pa., assignor to Asko, Inc., West Homestead, Pa.

Filed Aug. 8, 1977, Ser. No. 822,626
Int. Cl.[2] B21B *31/08*
U.S. Cl. 72—237 **18 Claims**



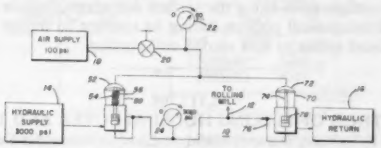
1. Roll apparatus for reducing work including an arbor, roll means mounted on said arbor for rotation therewith, a member mounted on said arbor adjacent said roll means, said member cooperatively forming with said roll means a chamber and a gap, said gap being located laterally of said roll means and being accessible from the outside of said member and roll means, means for sealing said chamber, means, connected to said arbor and member, for preventing movement of said member along said arbor relative to said arbor, means, connected to said chamber, selectively operable, for injecting fluid into said chamber, to exert pressure in said chamber to elongate said arbor and to enlarge the width of said gap, and for draining said fluid from said chamber to contract said arbor and reduce the pressure in said chamber to reduce the width of said gap, and a spacer having a width greater than said reduced width of said gap and smaller than said enlarged width of said gap to be interposed in said gap after its width is enlarged and to be compressed after the width of said gap is reduced, said spacer when so interposed impressing lateral pressure on said roll means to prevent rotation of said roll means relative to said arbor.

4,117,706

REMOTELY ADJUSTABLE HYDRAULIC PRESSURE REGULATOR

Richard A. Lami, Hennepin, Ill., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Sep. 23, 1977, Ser. No. 835,888
Int. Cl.[2] B21B *31/32*
U.S. Cl. 72—245 **20 Claims**



1. A remotely adjustable, back pressure relieving hydraulic pressure regulating system for providing hydraulic fluid at a regulated pressure from a hydraulic supply, in response to a control air signal, comprising:

a first air-operated valve operable between an open position and a closed position, having an inlet connected to the hydraulic supply and an outlet, constructed to be biased to the open position by the pressure of the control air signal and baised to the closed position by the hydraulic pressure at its outlet;

a second air-operated valve operable between an open position and a closed position, having an inlet connected to the outlet of said first air-operated valve and an outlet connected to a hydraulic return, constructed to be biased to the closed position by the pressure of the control air signal and biased to the open position by the hydraulic pressure at its inlet; and,

air pressure adjusting means for adjusting the pressure of the control air signal.

4,117,707

APPARATUS FOR SHAPING ELECTRICAL COILS FOR DYNAMOELECTRIC MACHINES

Mark Kolesar, N. Huntingdon Twp., Westmoreland County, and Harry C. Rettger, Wilkins Twp., Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 23, 1977, Ser. No. 836,172
Int. Cl.[2] B21D *11/10*
U.S. Cl. 72—306 **11 Claims**

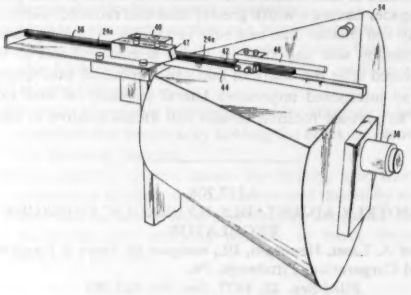
1. An apparatus for shaping electrical coil bars for dynamoelectric machines, said apparatus comprising:

means for securing a first portion of an electrical coil bar in a substantially straight configuration;

a rotatable member having an axis of rotation generally parallel to the coil bar's first portion, said member including a frustoconically shaped portion having predetermined major and minor axes and a predetermined cone angle;

first means for bending a second portion of the bar at a predetermined angle to said first portion to form a drop bend radius therein and to cause it to lie along said frustoconical portion's surface;

means for rotating the frustoconical portion through selected angular displacements; and



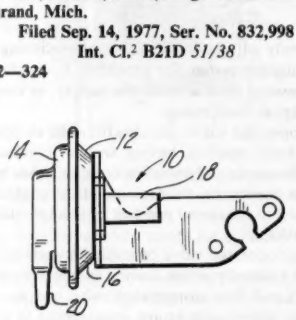
means for guiding the second coil bar portion in a spiral configuration along the surface and about the axis of the frustoconical portion during its rotation to impart a cell bend radius to said second coil portion.

4,117,708

METHOD OF MAKING HOUSING COVER AND TUBE

Leon F. LaVene, Durand, Mich., assignor to Schmelzer Corporation, Durand, Mich.

Filed Sep. 14, 1977, Ser. No. 832,998
Int. Cl.[2] B21D *51/38*
U.S. Cl. 72—324 **11 Claims**



1. The process of forming a housing member with an integral inlet tube extending radially therefrom from a flat metallic member comprising: forming a circular work piece portion in said flat metallic member, progressively shaping said circular work piece portion to form a tube extending parallel to and at one side of the axis of said circular work piece portion, tilting the tube relative to said circular work piece portion to a position diverging from the axis thereof, displacing the tube from its diverging position to a radially extending position, and separating said cover from said flat metallic member.

4,117,709

CAMBER ADJUSTING TOOL

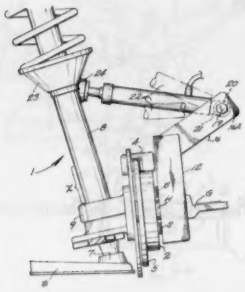
Edwin C. Jackson, 200 W. 22nd St., McMinnville, Oreg. 97128

Filed Jun. 22, 1977, Ser. No. 809,112
Int. Cl.[2] B21D *1/12*
U.S. Cl. 72—386 **2 Claims**

1. A tool for adjusting the camber of an automobile wheel of an automobile having a strut type wheel suspension system, said tool comprising,

a base for attachment to the wheel carrying member of the automobile suspension system, said base defining an opening within which the spindle housing of the suspension system may be received and which enables the temporary attachment of a camber sight gauge to the spindle housing, said base including upwardly and outwardly inclined arms,

an abutment assembly carried at the upper distal ends of said arms and including a fitting having an abutment surface thereon, fastener means extending intermediate said arms and mounting said fitting therebetween and permitting rotational positioning and locking of said fitting and the abutment surface thereon about a horizontal axis to locate said surface normal to the inclined axis of a portable hydraulic cylinder locatable intermediate said abutment assembly and the upper end of the strut associated with the wheel regardless of variances in length such struts utilized on different makes and models of automobiles and resulting cylinder inclination changing therebetween to enable remedial bending of the strut for camber adjustment.

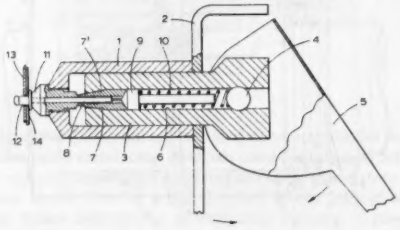


4,117,710

BLIND RIVETING TOOLS

James F. Fluester, Thornton Heath, England, assignor to Spiralux Limited, England

Filed Apr. 28, 1977, Ser. No. 791,778
Claims priority, application United Kingdom, May 5, 1976, 18398/76
Int. Cl.[2] B21J *15/34*
U.S. Cl. 72—391 **7 Claims**



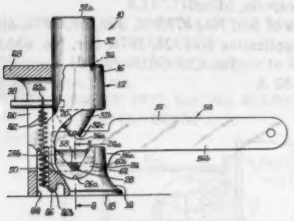
1. A multi-part collet for a blind riveting tool, the internal surface of each part of the collet being provided with a shape which further includes a longitudinal groove, that portion of the internal surface of each collet part which forms a gripping surface for the mandrel of a rivet being formed with a plurality of transverse ridges, and the groove of each collet part extending over the entire length of said ridged portion, wherein each longitudinal groove is so shaped that it defines with the adjacent edges of each transverse ridge areas a substantial point contact with the mandrel of a blind rivet.

4,117,711

COMBINATION CUTTING AND CRIMPING TOOL

Wayne R. Medcraft, Lakeville, Minn., assignor to Belden Corporation, Geneva, Ill.

Filed Oct. 17, 1977, Ser. No. 842,627
Int. Cl.[2] B21K *13/02*
U.S. Cl. 72—413 10 Claims



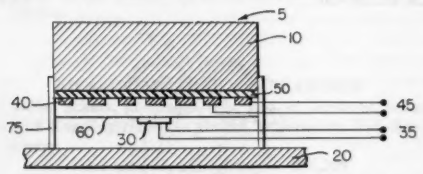
1. A combination cutting and crimping tool arrangement comprising, in combination, a housing defining anvil means adapted to receive a cable thereon in supporting relation therewith, said housing further defining a mandrel guide bore having an axis intersecting said anvil means, a mandrel supported within said guide bore and longitudinally movable therein, said mandrel having crimping means thereon for cooperation with said anvil means to crimp a connector body onto the portion of said cable supported on said anvil means when said mandrel is impacted to effect engagement of said crimping means with said connector body, said housing having a slot formed therein intersecting said anvil means and lying in a plane coplanar with the axis of said mandrel, and a cutting tool adapted to be inserted within said slot so as to overlie said anvil means and underlie said mandrel, said cutting tool having a cutting edge thereon adapted to cut a cable supported on said anvil means when an axial force is imparted to said mandrel in a direction to impart an impact force to said cutting edge sufficient to shear the cable.

4,117,712

EMISSIMETER AND METHOD OF MEASURING EMISSIVITY

Nathaniel E. Hager, Jr., Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Jan. 23, 1976, Ser. No. 651,762
Int. Cl.[2] G01N *25/00*
U.S. Cl. 73—15 A 14 Claims



1. A method of measuring total hemispherical emissivity of a surface without prior knowledge of the surface's temperature without requiring maintenance of a known temperature difference during measurement and comprising the steps of:

(a) providing a heat sink, having a heater and a heat flux sensor with an exposed surface of known emissivity;

(b) equalizing the temperature of said heat sink and of said surface whose emissivity is to be measured;

(c) spacing said sink from said surface by a predetermined distance with said sink surface of known emissivity opposite said surface to be measured;

(d) energizing said heater with a predetermined current; and,

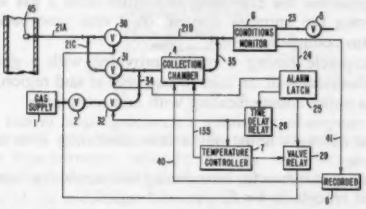
(e) monitoring said heat sensor output at its steady-state value.

4,117,713

PARTICULOGRAPHY AS AN ON-LINE TECHNIQUE FOR DETECTION AND LOCATION OF FAULTS WITHIN A GAS-COOLED DYNAMOELECTRIC MACHINE CAUSED BY OVERHEATING

David C. Phillips, Penn Hills; William M. Hickam, Churchill Borough, and Gerald L. Carlson, Mt. Lebanon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 28, 1977, Ser. No. 763,482
Int. Cl.[2] G01N *25/02*
U.S. Cl. 73—17 R 9 Claims



1. An on-line method of using thermoparticulography as a technique of identifying thermoparticulates in a gas stream, comprising:

detecting the presence of said thermoparticulates in said gas stream;

collecting a sample of said thermoparticulates from said gas stream;

isolating said sample from said gas stream,

reparticulating said sample by heating said sample at a predetermined rate;

measuring the temperature of said sample while measuring the particulate intensity as indicated by the output signal of said gas stream monitor; and

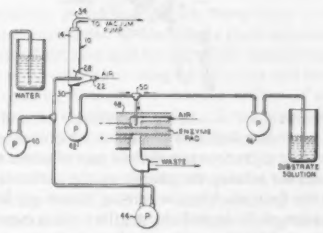
preparing a thermoparticulograph by plotting said particulate intensity as a function of temperature of said collected sample during reparticulation.

4,117,714

METHOD AND APPARATUS FOR CONTINUOUSLY EXTRACTING TRACE CONTAMINANTS FROM AIR AND MONITORING THE CONTAMINANT CONTENT THEREOF

Louis H. Goodson, Kansas City, and William B. Jacobs, Independence, both of Mo., assignors to Midwest Research Institute, Kansas City, Mo.

Filed May 12, 1977, Ser. No. 796,160
Int. Cl.[2] G01N *31/00*
U.S. Cl. 73—23 8 Claims



1. A method of extracting impurities from a gas and monitoring the impurity content thereof on a real time basis, said method comprising the steps of:

providing a receptacle having a region defined by a generally cylindrical wall;

continuously supplying a fresh scrubbing liquid to said receptacle which flows to said region;

continuously withdrawing the liquid from said region at substantially the same rate that it is being supplied thereto to maintain a predetermined quantity of scrubbing liquid therein;

introducing said gas under pressure into said region in a direction tangentially of said wall to rotate the liquid therein as a thin film and cause the gas to pass through said film in scrubbing relationship thereto, so that impurities in the gas are extracted into the liquid, and out of said region; and

examining at least a portion of the withdrawn liquid to detect impurities therein extracted from the gas.

3. Apparatus for extracting impurities from a gas and for monitoring the impurity content on a real time basis, said apparatus comprising:

a receptacle having a region provided with a generally cylindrical wall, an inlet in said wall at said region, and a gas outlet communicating with said receptacle,

said receptacle containing a scrubbing liquid in said region and having a liquid outlet communicating with said region;

liquid input means for introducing said scrubbing liquid into said receptacle for flow to said region;

means connected to said input means and said liquid outlet for continuously supplying fresh liquid to said region and continuously withdrawing the liquid therefrom to maintain a predetermined quantity of scrubbing liquid therein;

means registering with said inlet for introducing gas under pressure into said region in a direction tangentially of said wall to rotate the liquid therein as a thin film forming a seal with said wall above said inlet, and cause the gas to pass through said film in scrubbing relationship thereto to said outlet, whereby impurities in the gas are extracted into the liquid;

means for detecting impurities in said liquid; and

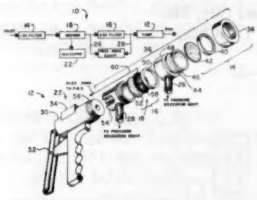
means for flowing at least a portion of said withdrawn liquid to said detecting means to monitor the presence of impurities in the withdrawn liquid extracted from the gas.

4,117,715

APPARATUS FOR MEASURING CHARGE ON, AND DENSITY OF, AIRBORNE PARTICULATES

Stuart A. Hoenig, Tucson, Ariz., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Jul. 5, 1977, Ser. No. 812,713
Int. Cl.[2] G01N *31/00*; G01R *5/28*
U.S. Cl. 73—28 **17 Claims**



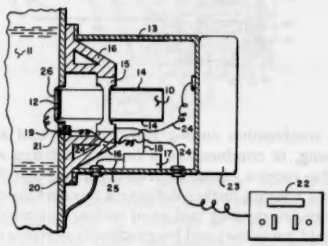
1. Apparatus for measuring the density of, and charge on, particulate contaminants suspended in a gas comprising means for providing a predetermined flow rate of contaminant-laden gas, means for sensing the charge on the particulate contaminants in the flow reaching the sensing means and for providing an indication of the sensed charge, the sensing means including filter means having an electrically conductive element for contacting particles within a predetermined size range to produce on the electrically conductive element an electrical indication of the polarity of the charge on the particulate contaminants within such size range, and means for measuring the density of particulate contaminants reaching the sensing means at the predetermined flow rate and for providing an indication of such density.

4,117,716

DENSITOMETER APPARATUS

Frank N. Simon, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 479,926, Jun. 17, 1974, abandoned.
This application Nov. 24, 1975, Ser. No. 634,689
Int. Cl.[2] G01N *11/16*
U.S. Cl. 73—32 A **16 Claims**



1. A sensor capable of providing a representation of density of a fluid and a representation of sonic velocity in a fluid, said sensor comprising:

a piezoelectric transformer, having electrical terminals therein serving as input terminals and output terminals, said transformer having surfaces thereof placed in motion in directions in which they are capable of imparting longitudinal wave energy to those portions of said fluid sufficiently near said surfaces;

oscillator circuitry means connected to provide an oscillating electrical signal at said input terminals; and

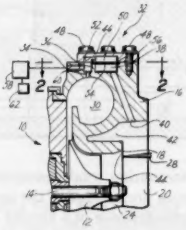
output voltage sensing means connected to sense an output voltage signal provided between said output terminals to provide at least one of said representations.

4,117,717

SOLID IMPURITY DETECTOR

Walter F. Isley, Grosse Pointe Farms, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jun. 23, 1977, Ser. No. 809,298
Int. Cl.[2] G01N *15/00*
U.S. Cl. 73—38 **6 Claims**



1. A device for detecting solid impurities in a pressurized fluid comprising;

a housing;

a fluid pump in said housing, said fluid pump having a high pressure outlet and a low pressure inlet;

said housing having a fluid passageway open at its first end to the pump outlet and open at its second end to a chamber

formed annularly around the pump inlet, said annular chamber being open to the pump inlet;

a filter element disposed across and covering said fluid passageway; and

pressure sensing means in communication with said passageway between its first end and said filter element.

4,117,718

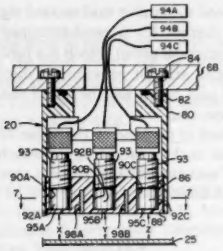
INTERNAL PRESSURE AND VACUUM MONITORING APPARATUS

Gary G. Hayward, Falmouth, Mass., assignor to Benthos Incorporated, Falmouth, Mass.

Filed Jul. 15, 1977, Ser. No. 815,987

Int. Cl.[2] G01M *3/36*

U.S. Cl. 73—52 **26 Claims**



1. Apparatus for monitoring the internal pressure within an enclosure having at least a flexible wall portion comprising:

first sensing means for measuring the distance between at least a first point on said flexible wall portion and said first sensing means and for providing in response thereto a first electrical signal, said first electrical signal being proportional to the distance between said first point and said first sensing means;

second sensing means for measuring the average of the distances between at least two other points on said flexible wall portion spaced from said first point and said second sensing means and for providing in response thereto a second electrical signal, said second electrical signal being proportional to the average of said distances between said at least two points and said second sensing means; and

means for comparing said first and second electrical signals and for providing in response to said comparison a third electrical signal, said third electrical signal being substantially proportional to the difference between said first and second electrical signals and substantially linearly proportional to the amount of deflection of said flexible wall portion.

4,117,719

MEASURING FRICTION BEARINGS

Karl Heinz Schütz, Püttlingen, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

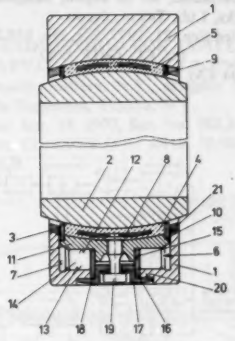
Filed Oct. 25, 1977, Ser. No. 845,209

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 7633570[U]

Int. Cl.[2] G01L *5/00*

U.S. Cl. 73—141 A **12 Claims**

12. In a measuring friction bearing assembly, such as a ball-and-socket bearing joint, which includes outer and inner bearing rings and a plurality of sliding bearing elements situated between said rings in sliding and bearing relationship, the improvement wherein said outer bearing ring comprises a wall portion having an inside surface facing said inner bearing ring with a recess defined in said surface and facing said inside ring, and wherein at least one of said sliding elements is replaced by a force-measuring element which is situated in said recess and comprises a sliding disk engaging said inner bearing ring, a supporting disk adjacent and secured to said sliding disk, a piezoelectric measuring means intermediate said support disk and said inside surface, and means for urging said supporting



disk toward said inside surface for securing said measuring means therebetween, whereby bearing load forces can be transmitted between said inner and outer bearing rings and measured via said force-measuring element.

4,117,720

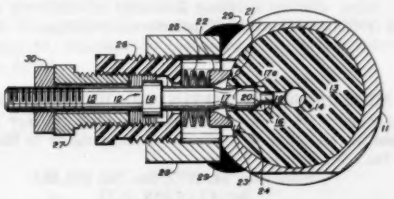
ELECTRIC MEASURING DEVICE HAVING A SMALL-BORE LIQUID CONTAINER WITH IMPROVED ELECTRODE SEALING MEANS

John Simonsen, Canandaigua; Bruce Douglas Gibson, and Heinz Walter Gruner, both of Irondequoit, all of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,709

Int. Cl.[2] G01F *1/58*

U.S. Cl. 73—194 EM **15 Claims**



1. An electric measuring device comprising a structure having a bore surrounded by a relatively thick deformable wall for containing fluid, said wall having a bore therethrough, such wall bore having one end opening into the first said bore and its other end opening through the exterior surface of said wall, said wall having an integral collar of compressible sealing material projecting outwardly of said first said bore, and said wall bore's said other end being surrounded by said collar;

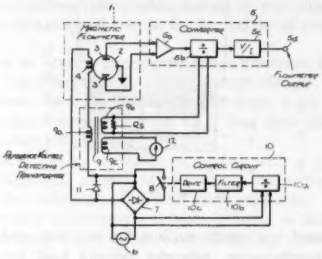
(a) said device also comprising electrodes, one such electrode being in said wall bore and projecting through said collar externally of said wall; there being compression means for compressing said collar toward and around said one electrode for sealing said one electrode in said wall bore;

(b) said device also comprising measuring circuitry connected to said electrodes.

4,117,721
MAGNETIC FLOWMETER

Kazuie Suzuki; Takashi Torimaru, both of Tokyo, and Chuji Akiyama, Yokohama, all of Japan, assignors to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Sep. 21, 1977, Ser. No. 835,327
Int. Cl.[2] G01F *1/60*
U.S. Cl. 73—194 EM **10 Claims**



1. In combination with a magnetic flowmeter in which the fluid to be metered is conducted through a flow tube having detecting electrodes therein, the fluid intercepting a magnetic field produced by an electromagnet to induce a flow rate signal in said electrodes, a system comprising:

A. circuit means to supply to said electromagnet a low-frequency excitation current having an a-c component and a d-c component;

B. a reference-voltage detecting transformer having a primary winding interposed in said excitation current supply means and a secondary winding across which is developed a reference voltage proportional to said excitation current, said transformer having a core subject to saturation by the magnetic flux generated by said d-c component;

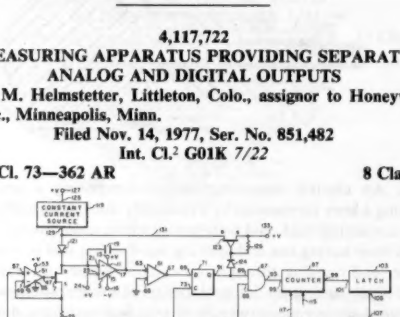
C. a converter responsive to said reference voltage and coupled to said electrodes to provide an output flow rate signal in which the influence of fluctuations in said a-c component on the detected flow rate signal is minimized; and

D. compensating means associated with said transformer to produce a magnetic flux therein which counteracts the effect of the magnetic flux produced by said d-c component, thereby avoiding saturation of said core and the resultant distortion of the reference voltage.

4,117,722
MEASURING APPARATUS PROVIDING SEPARATE ANALOG AND DIGITAL OUTPUTS

Paul M. Helmstetter, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 14, 1977, Ser. No. 851,482
Int. Cl.[2] G01K *7/22*
U.S. Cl. 73—362 AR **8 Claims**



1. Measuring apparatus for providing both an analog output and a digital output which are representative of the value of a condition to which a condition sensing element is exposed, comprising

a condition sensing element having an electrical characteristic of a value dependent upon the value of the condition to which the element is exposed,

means connected to said element for passing a current through said element to cause the value of said current to be a function of said charactistic of said element, and for deriving an integral signal of a value which is the time integral of the value of said current,

means connected to receive said integral signal and responsive to the value thereof for shifting that value to a base level each time that that value crosses a reference level, and for producing a pulse in a second signal upon each such shift,

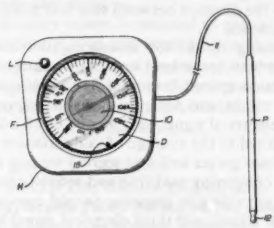
means connected to receive said second signal for counting said pulses thereof for a predetermined time period to provide a numerical count which is a function of the value of said current, and for providing a digital output representative of said count and hence of the digital value of said condition, and

means connected to respond to the value of said current for producing an analog output signal which is a function of the value of said current and hence is representative of the value of said condition.

4,117,723
ELECTRONIC THERMOMETER

Rudolph Maravich, 1842 Galaxy Dr., Newport Beach, Calif. 92660

Filed Oct. 26, 1976, Ser. No. 735,592
Int. Cl.[2] G01K *7/24*
U.S. Cl. 73—362 AR **7 Claims**



1. An electronic thermometer comprising: a bridge circuit a temperature variable resistor and a manually variable resistor, dial means for adjusting the manually variable resistor and indicating temperature, and light emitting diode means for indicating that the temperature sensed by the temperature variable resistor is indicated by said dial means including means for instantaneously energizing said diode means when said dial indicates the temperature sensed by said temperature variable resistor.

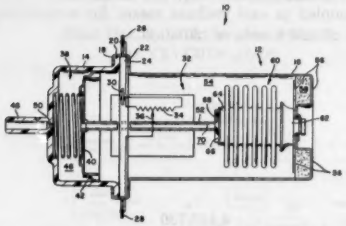
4,117,724
AMBIENT PRESSURE SENSOR

John E. Cook, Chatham, Canada, assignor to Fram Corporation, East Providence, R.I.

Filed Sep. 7, 1977, Ser. No. 831,219
Int. Cl.[2] G01L *7/12, 9/02*
U.S. Cl. 73—386 **13 Claims**

1. An ambient pressure sensor for generating an electrical signal which varies in response to changes in ambient pressure level comprising ambient pressure responsive means having a physical characteristic which varies in response to variations in ambient pressure level, a housing, a fluid motor responsive to fluid pressure to move within said housing, an actuating mem-

ber carried by said fluid motor, said actuating member and said ambient pressure responsive means including valve means responsive to variations in said physical characteristic of the ambient pressure responsive means for regulating the fluid



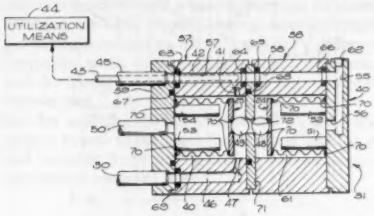
pressure communicated to said fluid motor, means responsive to movement of the fluid motor for generating an electrical signal which varies in accordance with the movements of the fluid motor, said fluid motor including means communicating the latter to a source of vacuum.

4,117,725

FLUID SAMPLING SYSTEM

Robert R. Austin, Pasadena, and A. M. D. Moen, Covina, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 11, 1976, Ser. No. 665,956
Int. Cl.[2] G01N *1/22*
U.S. Cl. 73—421.5 R **15 Claims**



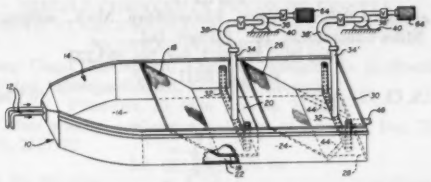
1. A fluid sampling system, said system comprising: a substantially fluid tight housing having a hollow interior divided by a partition into first and second chambers, said partition having a hole therethrough; a first valve mounted on said housing and actuable to close an end of said hole opening into said first chamber; a second valve mounted on said housing and actuable to close the other end of said hole, said other hole end opening into said second chamber, said housing having spaced inlet and outlet passages opening into and out of said second chamber, respectively, for circulation of a carrier fluid through said second chamber, said housing having opening means extending therethrough into said first chamber to permit a sample fluid to flow into said first chamber; actuating means to open and to close said first valve in succession while holding said second valve closed, and vice versa, said first and second valves being spaced apart when both are closed, said first and second valves and said partition defining a closed sample chamber in said hole when said first and second valves are closed, a sample of said sample fluid being permitted to fill said sample chamber when said second valve is closed and said first valve is opened, said sample chamber being filled with said sample fluid upon closure of said first valve, subsequent opening of said second valve permitting a carrier fluid circulated through said second chamber to purge said sample chamber of said sample fluid previously trapped or captured therein, said actuating means repeating the aforesaid opening and closing of said first and second valves so as to expose a sample fluid filled sample chamber to said second chamber at regular intervals to permit purging thereof at regular intervals by a constant flow of carrier gas.

4,117,726

APPARATUS AND METHOD FOR SAMPLING WATER FOR FISH LARVAE AND OTHER TROPHIC LEVELS

Peter M. McGroddy, Suffern, N.Y., assignor to Lawler, Matusky & Skelly Engineers, Tappan, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,367
Int. Cl.[2] G01N *1/10;* **A01K** *79/00*
U.S. Cl. 73—421 R **14 Claims**



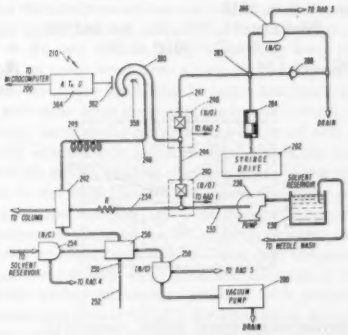
1. Apparatus for collecting fish larvae and other trophic levels without damage to the larvae by passage through a pump, said apparatus including in combination a chamber into which water containing the larvae flows, a fine mesh partition at one end of the chamber and through which water passes, the mesh being too fine to permit passage of the larvae to be collected so that the larvae become concentrated in the water that has not yet passed through the mesh, the mesh partition sloping downward in the direction in which the water flows toward the mesh partition, the partition being in such position that water passes upward through the mesh partition, a passage through which water containing concentrated larvae flows from the chamber to a collection region, and means for reducing the pressure in the chamber, on the upstream side of the mesh partition, below that of the water from which the larvae are collected, so that water flows into the chamber freely without passing through a pump, and means for reducing the water pressure on the downstream side of the mesh partition to obtain a controlled rate of flow through the mesh partition.

4,117,727

BUBBLE SENSOR AND METHOD

David R. Friswell, 394 Gorwin Dr., Holliston, Mass. 01746, and Burleigh M. Hutchins, 59 Lakewood Dr., North Attleboro, Mass. 02760

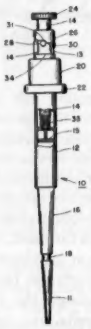
Filed Dec. 12, 1977, Ser. No. 859,531
Int. Cl.[2] G01N *1/10*
U.S. Cl. 73—422 GC **25 Claims**



1. In a liquid chromatographic system, the combination comprising:

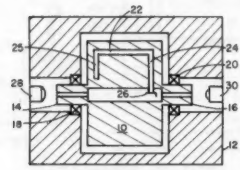
a sample conduit,
a pressure sensor coupled to said conduit,
means for forming an enclosed space including said conduit,
means for changing the volume of said enclosed space by increments starting from a first volume to change the pressure applied to said conduit with sample enclosed by increments starting from a first pressure,
whereby the incremental changes in pressure sensed by said sensor resulting from said volume changes afford an indication of bubble inclusion in said sample.

4,117,728
PIPETTE
Leighton Clifford Johnson, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed Dec. 22, 1977, Ser. No. 863,223
Int. Cl.[2] B01L *3/02*
U.S. Cl. 73—425.6 **10 Claims**



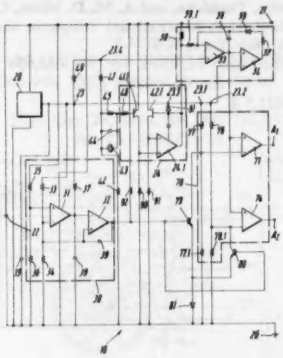
1. In a pipette or the like having a barrel provided at one end with a restricted opening, a piston within said barrel having a plunger attached thereto and coaxially projecting from the other end of said barrel, the improvement which comprises cooperable shoulder means on said barrel and plunger relatively movable to a plurality of operative positions, said shoulder means defining first and second axially spaced positions of said plunger with respect to said barrel and at least one third position of said plunger located intermediate said first and second plunger positions, said shoulder means defining said plunger positions at respectively different operative positions.

4,117,729
INERTIAL MEASUREMENT DEVICE
Roger O. Topliffe, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Oct. 17, 1977, Ser. No. 842,705
Int. Cl.[2] G01P *15/08*
U.S. Cl. 73—516 LM **9 Claims**



1. An inertial measurement device, comprising:
a stator;
a rotatable member arranged for rotation within said stator and a fluid-filled chamber therein, said chamber located on an axis parallel to the axis of rotation of said rotatable member but not coincident therewith;
resilient means coupled to said rotor and responsive to the inertial forces incident on said fluid;
a source of radiation; and
means coupled to said resilient means for modulating the output of said source of radiation.

4,117,730
SENSOR SYSTEM FOR RELEASING PASSIVE SAFETY APPARATUS IN CAR CRASHES
Johann Spies, Pfaffenhofen, and Alfons Wohrl, Schrobenhausen, both of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany
Filed Mar. 22, 1977, Ser. No. 780,015
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1976, 2612215
Int. Cl.[2] B60R *21/00*
U.S. Cl. 73—517 R **16 Claims**

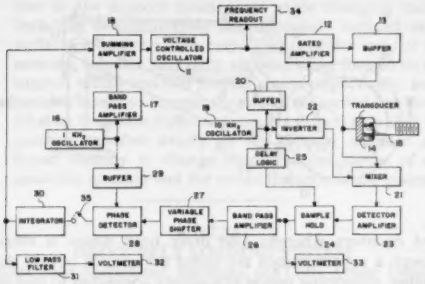


1. A sensor system for releasing passive safety systems such as air cushions, belt tighteners or similar arrangements, during car collisions, comprising:
transducer means for providing an electrical signal responsive to vehicular accelerations;
means for supplying an input voltage;
reference voltage means, responsive to said means for supplying an input voltage, for supplying a stabilized reference voltage to said sensor system;
amplifier means responsive to said electrical signal from said transducer means for effecting bipolar asymmetrical limitation of said electrical signal;
means responsive to said electrical signal from said transducer means and to said amplifier means for integrating said electrical signal;
switching threshold means for providing release signals to said passive safety systems, said switching threshold means further including evaluation circuit means for setting predetermined switching conditions of said switching threshold means, said switching threshold means responsive to said integrating means and said reference voltage means; and
voltage monitor means responsive to said input voltage supply means and said reference voltage means for blocking the release signals from the switching threshold means upon the occurrence of an improper voltage condition.

4,117,731
PSEUDO CONTINUOUS WAVE INSTRUMENT

Joseph S. Heyman, Gloucester, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 8, 1977, Ser. No. 858,763
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—579 **10 Claims**



1. A device for measuring the acoustic properties and their changes in a sample comprising:

a variable frequency source;

transducer means for applying the output of said variable frequency source to said sample;

means for periodically interrupting the application of said variable frequency source to said sample for a short duration;

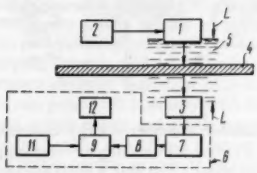
means connected to said transducer means for receiving the resulting acoustic signals during said interruptions for producing a control signal indicative of a difference in the frequency of the output of said variable frequency source and the frequency of a mechanical resonant peak of said sample; and

means for applying said control signal to said variable frequency source to maintain the frequency of the output of said variable frequency source at the frequency of said mechanical resonant peak.

4,117,732
METHOD FOR CHECKING THICKNESS OF SHEET MATERIALS BY USING ACOUSTIC OSCILLATION AND DEVICE FOR EFFECTING SAME

Nikolai Ivanovich Brazhnikov, 1 ulitsa Bebelya 3, korpus 11, kv. 48, Moscow, U.S.S.R.

Filed Feb. 17, 1976, Ser. No. 658,478
Int. Cl.[2] G01B *17/00*
U.S. Cl. 73—599 **12 Claims**

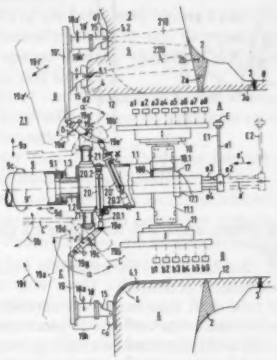


1. A method of checking the thickness of sheet materials by using acoustic oscillations, comprising the steps of placing a sheet of material being checked into an acoustically conducting medium; periodically transmitting acoustic oscillations into the acoustically conducting medium and establishing a travelling wave which is directed in a direction substantially perpendicular to the surface of the sheet; receiving and measuring the transmitted acoustic oscillations in said medium which have passed through the sheet material being checked; comparing the amplitude of the measured acoustic oscillations or signals which have passed through the sheet with a reference signal which has an amplitude corresponding to that of acoustic oscillations or signals passed through material of a predetermined thickness; and determining the thickness of the sheet material being checked based on the relative values of the transmitted and reference signals.

4,117,733
TEST SYSTEM CARRIER FOR ULTRASONIC TESTING OF NOZZLE SEAMS, PIPE CONNECTION SEAMS AND NOZZLE CORNERS IN PRESSURE VESSELS, PARTICULARLY REACTOR PRESSURE VESSELS OF NUCLEAR POWER PLANTS

Georg Gugel, Kalchreuth, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Germany

Filed Dec. 20, 1976, Ser. No. 752,299
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557992
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—634 **10 Claims**



1. Test system carrier for ultrasonic testing of nozzle seams, pipe connection seams and nozzle corners in pressure vessels, the carrier being supported at the end of a telescopic tube for executing stroke and rotary motions in or about the axis of the nozzle, the telescopic tube being adjustably mounted on the central mast of a central-mast manipulator so as to be adjustable in elevation and rotatable about the axis of the central mast as well as about its own axis comprising, in combination, inner-periphery test-head carrier means for ultrasonically testing seams formed in the nozzle and seams between pipe connections and the nozzle as well as zones adjacent thereto; a tiltable test-head carrier having at least one drag lever pivotally attached to the test system carrier, said drag lever having an inner and an outer lever arm, tilting drive means coupled to said inner lever arm for tilting the same, test-head means carried by said outer lever for testing the nozzle corners, said drag lever being successively movable so as to bring said test-head means into contact with surfaces at the end of the nozzle, the corner of the nozzle and the inner periphery of the nozzle and movable in test tracks within the entire respective peripheral angle range thereof; said test head means being engageable with the respective test tracks to be contacted, means for telescoping said telescopic tube so as to shift the pivot axis of said drag lever axially away from the telescoping tube, said drag lever having an angular position with respect to the telescoping tube that is variable for contacting the respective test tracks, said drag lever being controllably movable into an inward folded-up rest position wherein said arms thereof are disposed on a diameter that is smaller than the daimeter of the inner periphery of the nozzle so that the test system carrier

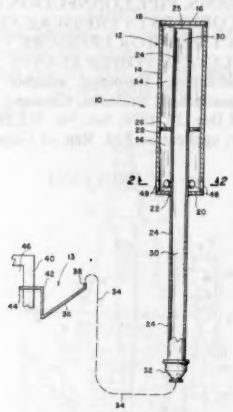
with said inner-periphery test-head carrier is axially displaceable unobstructedly through the nozzle.

4,117,734

APPARATUS FOR INDICATING TRUE FURNACE DRAFT

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Nov. 28, 1977, Ser. No. 855,235
Int. Cl.[2] G01L *7/00*
U.S. Cl. 73—756 **4 Claims**



1. In a furnace system, apparatus for indicating true furnace draft, comprising;

(a) piezometric chamber means for indicating a true average value of atmospheric pressure;

(b) an inclined tube draft manometer, the atmospheric pressure end or first end connected to said piezometric chamber, the second end connected to a tube passing through the wall of said furnace into the interior thereof;

and wherein said piezometric chamber comprises;

(c) an elongated vertical first pipe of a first internal diameter D, closed at the top and bottom, a plurality of small diameter ports drilled through the wall, near the bottom end thereof, uniformly spaced circumferentially;

(d) a second pipe of smaller internal diameter *d*, inserted co-axially through the bottom closure of said first pipe, and extending almost to the top thereof;

(e) an annular baffle plate of less diameter than D, attached to said smaller pipe, inside of said chamber, providing a narrow annular passage for flow of air from and to said ports and the interior of said second pipe; and

(f) tubular means connecting the bottom end of said second pipe to said first end of said manometer.

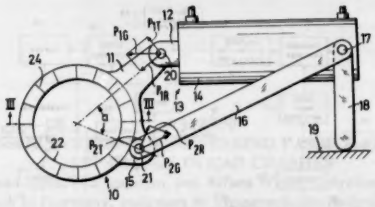
4,117,735

POWER WRENCH

Paul-Heinz Wagner, Much-Birrenbachshöhe; Richard Hirtsiefer, Neunkirchen, and Johann Müller, Much-Nesshoven, all of Fed. Rep. of Germany, assignors to Paul-Heinz Wagner Maschinenfabrikation, Fed. Rep. of Germany

Filed Mar. 11, 1977, Ser. No. 776,745
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654466
Int. Cl.[2] F16H *21/18*
U.S. Cl. 74—47 **10 Claims**

1. A power wrench comprising first and second relatively linearly movable members, an at least partially annular drive head means for rotating screws, nuts and the like, first pivot means for pivotally connecting a first end portion of said first member to said drive head at a first position of the latter, a third member having first and second end portions, second pivot means for pivotally connecting said third member first end portion to said second member, third pivot means for pivotally connecting said third member second end portion to said drive head at a second position of the latter arcuately spaced from said first position whereby upon relative linear movement of said first and second members turning torque is imparted to said drive head means through both said first and



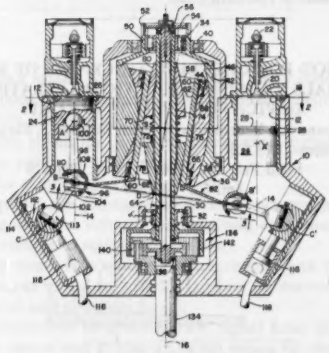
third members whereby said drive head means is rotated through a predetermined arc under the control of said third member, supporting means articulately connected to said second member for freely contacting a support surface along any one of a plurality of points thereof, and said supporting means being disposed generally normal to said second member during the operation of said power wrench including the relative linear movement of said first and second members.

4,117,736

VARIABLE STROKE EXPANSIBLE ENERGY CONVERSION MACHINE HAVING STATIC CONTROL MEANS

Yves Jean Kemper, Birmingham, Mich., and Harvey N. Pouliot, Livermore, Calif., assignors to Vadetec Corporation, Troy, Mich.

Filed Jan. 19, 1977, Ser. No. 760,693
Int. Cl.[2] F16H *23/00*
U.S. Cl. 74—60 **14 Claims**



1. In an expansible chamber energy conversion machine having a frame, a torque transmitting member supported by the frame for rotation about a first axis, a nutatable member having journal surfaces concentric with a second axis intersecting the first axis at an angle to establish a point of axes intersection, support means rotatable on the first axis and rotatably supporting the nutatable member for movement of the second axis in a biconical path about the first axis with the apex of the biconical path coincident with the point of axes intersection, a piston reciprocable on a third axis through a stroke distance in a working fluid chamber having an end face fixed relative to the frame and a linkage assembly having a swivelling compression

link for interconnecting the piston with the nutating member, one end of the link being swivelled on the frame and the other end thereof being swivelled with the nutating member for movement in a path perpendicular to and symmetric about a line passing through the point of axes intersection, the improvement comprising:

journal means carried by the support means to rotatably engage the journal surfaces on the nutating member;

means for changing the angle of first and second axes intersection upon axial movement of said journal means relative to the support means, said angle changing means including complementing and oppositely inclined ramp surfaces effective at the respective opposite ends of the nutating member, said ramp surfaces being formed on the support means and said journal means respectively; and

adjustable means to support the end of the swivel link swivelled on the frame for movement in a direction to shift the nutating member axially of the support member and frame, thereby to change the nutational throw of the nutatable member and the stroke distance of the piston.

4,117,737

DRIVE BELT LOADING SYSTEM

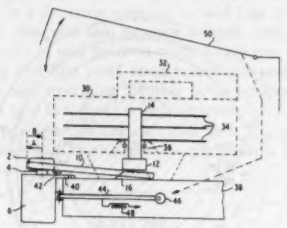
Patrick John Mulholland, Eastleigh, and Colin Arthur Thomas, Alresford, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1976, Ser. No. 746,904

Claims priority, application United Kingdom, Dec. 29, 1975, 52961/75

Int. Cl.[2] F16H *7/22, 7/08, 7/10;* **G11B** *17/00*

U.S. Cl. 74—242 **6 Claims**



1. A system for automatically loading and unloading a drive belt onto a driven pulley which is permanently associated with a replaceable device which is removable in a non-horizontal direction parallel to the axis of rotation of said driven pulley, said system comprising:

(1) means for supporting said device with the axis of rotation of said driven pulley substantially parallel to said direction and in a non-horizontal plane;

(2) means positioned between said device supporting means and the said driven pulley and non-removably attached to said supporting means for guiding a drive belt from a first untensioned position to a second tensioned position on said driven pulley, said guide means including at least one surface sloping towards said driven pulley from said supporting means defining a portion of a conical frustum having its axis positioned coaxially with the axis of rotation of said driven pulley and a belt support surface extending normal to the axis of said frustum;

(3) a driving pulley having an axis of rotation substantially parallel to said axis of rotation of said driven pulley and positioned in substantially the same plane as said driven pulley;

(4) means permanently associated with said driving pulley for preventing gravity from disengaging said belt completely from said driving pulley when the belt is not under tension; and

(5) means for applying tension to said belt when said belt is in said first position to cause said guide means to automatically transfer said belt to said driven pulley as said driving pulley is rotated and to transfer said belt to said guiding surface by gravity when said tension is released and said driving pulley stops.

4,117,738

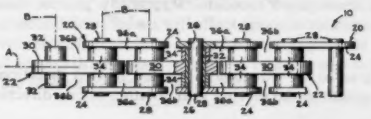
CHAIN FOR ENGAGEMENT WITH DOUBLE SPROCKET

John F. McKeon, Carmel, Ind., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 3, 1976, Ser. No. 738,499

Int. Cl.[2] F16H *57/04*

U.S. Cl. 74—250 R **4 Claims**



1. A chain for engagement with a double sprocket comprising in combination

a plurality of pin links, each having a pair of laterally spaced longitudinally extending side bars and a pair of longitudinally spaced laterally extending pins between and connecting said side bars,

a plurality of center links each having a center bar provided with longitudinally spaced apertures receiving said pins therethrough,

said center bars disposed between said side bar pairs and parallel thereto in laterally spaced relation thereto,

said center bars alternately arranged with respect to said pin links each so that each center bar between adjacent pairs of pin links receives a pin of one pin link pair through one center bar aperture and receives a pin of the other pin link pair longitudinally adjacent thereto through the other center bar aperture,

said adjacent center bars having a closely spaced end-to-end non-overlapping relationship to each other with adjacent ends of each two bars disposed between a single pair of pin link side bars, and,

said side bars of adjacent pin links having a closely spaced end-to-end relationship with each other,

thereby defining pockets for cooperation with said sprocket between each side bar and the ends of a laterally adjacent pair of end-to-end center bars, and between each center bar and the ends of a laterally adjacent pair of end-to-end side bars.

4,117,739

GEAR DRIVES WITH DIRECTION OF ROTATION REVERSAL

Heinz Meier; Egon Zurawski, both of Berlin, and Paul Greppmaier, Nuremberg, all of Fed. Rep. of Germany, assignors to Triumph Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,653

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2648911

Int. Cl.[2] F16H *57/00, 55/04*

U.S. Cl. 74—404 **11 Claims**

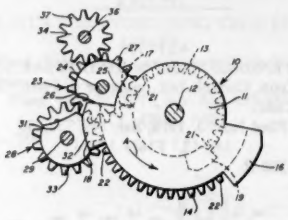
1. A gear mechanism for use in rotating a character wheel, the mechanism comprising:

a rotatable driving gear having at least one segment of gear teeth,

a first idler gear having gear teeth which are engagable with said driving gear,

a second idler gear having gear teeth which are engagable with said driving gear,

a driven gear having gear teeth in engagement with at least one of said idler gears, said mechanism causing the driven



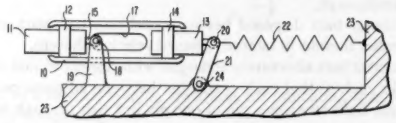
gear to be sequentially rotated in two directions in response to the driving gear rotating in one direction.

4,117,740

MULTI-STROKE THROTTLE LINKAGE MECHANISM

Leland L. Howland, Rosemount, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Jul. 12, 1977, Ser. No. 814,960
Int. Cl.[2] G01M *1/16*
U.S. Cl. 74—469 **4 Claims**



1. A multi-position throttle mechanism for an engine having an engine frame and a pivoted throttle lever, comprising a link body, a first servo device carried by said body and having an arm extendable from a first position to a second position upon actuation of its servo mechanism, a second servo device carried by said body and having an arm extendable from a first position to a second position upon actuation of its servo mechanism, the free end of the arm of said first servo device being secured to the engine frame and the free end of the arm of the second servo device being secured to the throttle lever pivoted on the engine frame whereby selective actuation of one or the other or both or neither of said first and second servo devices results in at least three selectively different pre-set throttle positions of the throttle lever.

4,117,741

COLLAPSIBLE STEERING COLUMN

Shigeru Yazane, Sakado, and Youetsu Mogami, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1976, Ser. No. 746,510
Int. Cl.[2] B62D *1/18*
U.S. Cl. 74—492 **9 Claims**

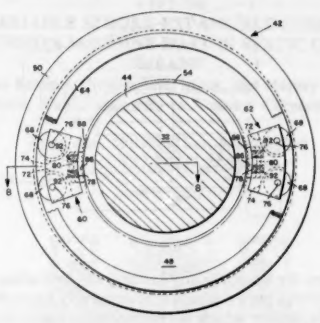
1. A collapsible steering column system comprising a steering shaft housed within a steering column; collapsible plate means positioned adjacent said steering column; and a press plate member secured to said steering column and positioned to engage said collapsible plate means and restrain said steering column, whereby said press plate member engages and collapses said collapsible plate means at impact and allows said steering column to move forward, and wherein said collapsible plate means is further defined as a plate having a portion of reduced cross-sectional area and two end portions adapted to anchor said collapsible plate means; and said press plate member is positioned to engage said portion of reduced cross-sectional area of said collapsible plate.

4,117,742

PERMANENT AUTOMATIC ROTOR BALANCER FOR SHAFTS OPERATING ABOVE CRITICAL SPEED

Philip C. Stein, 20th St. & Indiana Ave., Philadelphia, Pa. 19132

Filed Jul. 29, 1977, Ser. No. 820,295
Int. Cl.[2] F16H *3/44, 57/10*
U.S. Cl. 74—573 R **14 Claims**



1. In combination with a rotor adapted to rotate above critical speed the improvement comprising an automatic balancer for the rotor comprising:

an annular housing secured to the rotor,

a pair of balancing weights on opposite sides of the center line of the rotor and mounted in the housing for movement about the axis of the rotor,

speed dependent clutch means for automatically maintaining said weights locked against movement about the axis of the rotor when the rotor is rotating below critical speed and unlocked and free to move about the axis of the rotor when the rotor is rotating above critical speed.

4,117,743

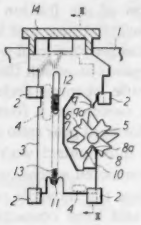
DEVICE FOR RETAINING TWO ALTERNATE POSITIONS

Tetsuro Suzuki; Masaaki Oishi, and Itaru Ashida, all of Tokyo, Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Apr. 19, 1977, Ser. No. 788,967
Claims priority, application Japan, Apr. 19, 1976, 51/44320
Int. Cl.[2] F16H *31/00;* H01H *19/14*
U.S. Cl. 74—577 M **3 Claims**

1. A device for retaining a member in two alternate positions

comprising a base plate, an operating member slidably supported on said base plate for reciprocatory movement in a selected direction and having two opposed pawls which are spaced apart and project toward one another in the direction of movement of said operating member, a position control cam and an integral supplementary cam rotatably mounted on said base plate between said pawls, said pawls being in different planes so that a first pawl is engageable with said position control cam and a second pawl is engageable with said supplementary cam, said position control cam having in its periphery deep concaves and shallow concaves alternately disposed and said supplementary cam having teeth at positions corresponding to the concaves of said position control cam, means biasing



siad operating member in a direction to bring said first pawl of said operating member alternately into engagement in said deep concaves and said shallow concaves of said position control cam and said second pawl being engageable with said teeth of said supplementary cam upon movement of said operating member in a direction opposite to said bias to index said supplementary cam and said position control cam to bring a succeeding cavity of said position control cam into position to be engaged by said first pawl upon return movement by said biasing means, said operating member being positioned in one position when said first pawl is in engagement in a deep concave of said position control cam and in a second position when said first pawl is in engagement in a shallow concave of said control cam.

4,117,744

TRANSMISSION FOR CRAWLER TRACTORS

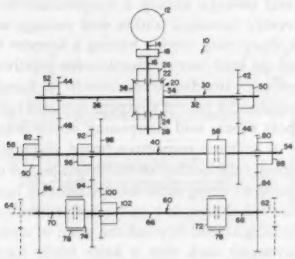
Michael Butculescu, Offenbach am Main, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Jan. 4, 1977, Ser. No. 756,661

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1976, 2601113

Int. Cl.² F16H *37/06*

U.S. Cl. 74—665 G **5 Claims**



1. A transmission for driving the opposite tracks of a track laying vehicle, comprising: an input shaft; a first shaft assembly arranged crosswise to and including first and second shaft sections located in axial alignment with each other and on opposite sides of the input shaft; a controllable reversing gear means connected between the input shaft and the first and second shaft sections for selectively driving the first shaft section in opposite directions while simultaneously driving the second shaft section oppositely to the first shaft section; a further shaft assembly arranged parallel to the first shaft assembly and including first and second axially aligned final drive input shaft sections; and first selectively engageable drive means connected between the first shaft section and first final drive input shaft section for establishing a drive connection between the first shaft section and the first final drive input shaft section and second selectively engageable drive means connected between the second shaft section and second final drive input shaft section for establishing a drive connection between the second shaft section and the second final drive input shaft section whereby simultaneous engagement of the first and second drive means will effect opposite rotation of the final drive input shaft sections and separate engagements of the first and second drive means will effect rotation of a selected one of the final drive input shaft sections.

4,117,745

TORQUE CONVERTER AND PLANETARY GEAR SET THEREFOR

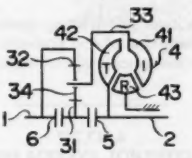
Akinori Yokoyama, and Mitsuaki Komatsu, both of Yokohama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 732,149

Claims priority, application Japan, Oct. 13, 1975, 50/122448

Int. Cl.² F16H *47/08*

U.S. Cl. 74—688 **20 Claims**



1. A torque converter and a planetary gear set therefor, said torque converter comprising an impeller, a turbine and a reactor; said planetary gear set comprising input means, a sun gear, a ring gear, a plurality of planet gears, a planetary carrier for connecting said planet gears, an output means, a first clutch connected to said output means, and a second clutch connected to said input means wherein one of the elements among said sun gear, said ring gear and said planetary carrier is connected directly to said input means, another element is connected directly to said impeller of said torque converter, and the other element is connected to said output means via said first clutch.

4,117,746

ORBITAL DRIVE MECHANISM

Michel A. Pierrat, Andover, Mass., assignor to Compudrive Corporation, Medford, Mass.

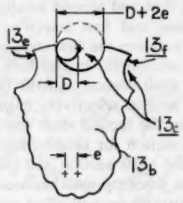
Filed Oct. 29, 1976, Ser. No. 736,899

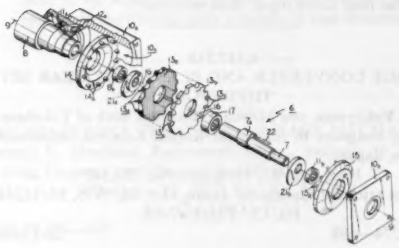
Int. Cl.² F16H *1/28*

U.S. Cl. 74—805 **9 Claims**

1. An orbital drive mechanism comprising two orbiting elements, one of which has peripheral surfaces acting as gear teeth and the other of which has peripheral open recesses which promote angular coupling isolated from orbital motion, means supporting said two elements for movements together eccentrically about an axis, two non-orbiting elements concentric with said axis, one of said non-orbiting elements being nested with said one of said orbiting elements and having peripheral surfaces acting as gear teeth which differ in number from the number of said gear teeth of said one of said orbiting elements, the other of said non-orbiting elements having peripheral surfaces of substantially circular curvature disposed within said peripheral open recesses of said other of said orbit-

ing elements, margins of said peripheral open recesses being shaped substantially as arcs of a circle having a diameter equal substantially to the diameter of said circular curvature plus





twice the eccentricity of said orbiting elements about said axis, and means restraining one of said non-orbiting elements from following angular movements of the orbiting element meshed therewith.

4,117,747

ELECTRONIC CONTROL SYSTEM FOR AUTOMATIC GEARBOXES

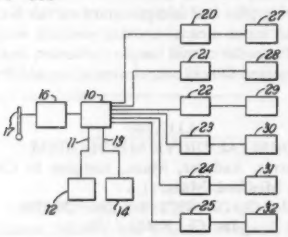
Harry Mellows Windsor, Leamington Spa, England, assignor to Automotive Products Limited, England

Continuation of Ser. No. 522,142, Nov. 8, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,588

Claims priority, application United Kingdom, Nov. 21, 1973, 54112/73

Int. Cl.[2] B60K *41/18*

U.S. Cl. 74—866 **1 Claim**



1. An automatic gearbox comprising a planetary gear system which provides at least three forward gear ratios, fluid pressure operated friction elements operatively connected thereto to change the gear ratios thereof, means for generating an electrical signal indicative of vehicle speed, means for generating an electrical signal indicative of throttle opening, electronic control circuits responsive to said signal means indicative of vehicle speed and throttle opening to control fluid pressure operation of said friction elements by means of solenoid valves so a gear is engaged which is appropriate to the vehicle speed and throttle opening, said electronic control circuits including means for combining said signal means indicative of vehicle speed and said signal means indicative of throttle opening, and a plurality of bistable state switching circuits each operatively connected with a forward gear change and each arranged to switch states when said combined signal is at a predetermined value, a manually operable switch for establishing connections for providing manual overriding signals to said electronic control circuits for the manual selection of forward gears, and at least one diode operatively connected between said throttle signal generating means and said switch and operatively connected when a gear is selected by operation of said manually operable switch, said diode provides a short-circuit connection to simulate for at least said selected and higher gears at least a full throttle opening condition, whereby the operation of the friction elements operatively connected with said selected gear and higher gears than said selected gear is not carried out until vehicle speeds at least equal to the vehicle speeds at which the friction elements are operated at full throttle opening under automatic control, wherein said selector switch has a fixed contact operatively connected with each forward gear ratio and a movable contact which can be moved into contact with any one of the fixed contacts, a diode is connected across successive pairs of fixed contacts whereby when the movable contact is moved into contact with one of said fixed contacts the diode or diodes connected to that and contacts operatively connected with higher gear ratios are forward-biased to provide said short circuit connection and the diode or diodes connected to contacts operatively connected with lower gear ratios are reverse biased.

4,117,748

KNIFE SCABBARD AND SHARPENING DEVICE

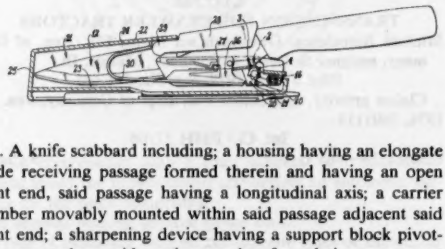
Keith Ernest Watts, Brunswick, Australia, assignor to Wiltshire Cutlery Company Proprietary Limited, South Melbourne, Australia

Filed Jul. 5, 1977, Ser. No. 812,693

Claims priority, application Australia, Jul. 28, 1976, 6786/76

Int. Cl.[2] B21K *11/02*

U.S. Cl. 76—86 **5 Claims**

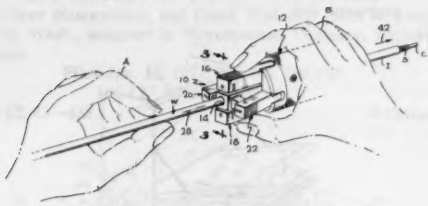


1. A knife scabbard including; a housing having an elongate blade receiving passage formed therein and having an open front end, said passage having a longitudinal axis; a carrier member movably mounted within said passage adjacent said front end; a sharpening device having a support block pivotally mounted on said carrier member for relative movement about a pivot axis extending transverse to the longitudinal axis of said passage, and a pair of sharpening plates rigidly secured to said support block, said sharpening plates being relatively arranged so as to have respective broad surfaces in opposed and overlapping relationship to define a zone of overlap, and said broad surfaces being substantially parallel to said support block pivot axis; a sharpening recess defined between edges of said plates which extend beyond the zone of overlap and are relatively arranged such that a knife blade located in said recess and engaging said edges is sharpened when moved longitudinally in said passage in either direction relative to said plates; said opposed surfaces being spaced apart so that a gap exists between them at least along said edges for the full depth of said recess and an immediately adjacent part of said zone of overlap; and each said opposed surface is polished to have a degree of roughness not greater than 0.5 micro meters Ra value.

4,117,749
WIRE STRIPPER

Merle A. Economu, Palmdale, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 9, 1976, Ser. No. 713,027
Int. Cl.[2] H02G *1/12*
U.S. Cl. 81—9.5 R **3 Claims**

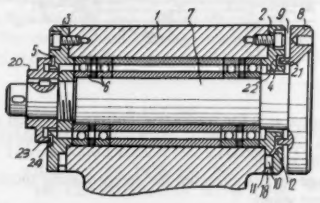


1. A wire stripper comprising:
a body forming a wire-receiving hole extending along a predetermined axis;
a first pair of jaws moveably mounted on said body to move toward and away from said axis, each of said first jaws having a blade with an edge that extends substantially perpendicular to said axis, said jaws positioned directly opposite one another so their blades can form part of the same circumferential cut in the wire; and
a second pair of jaws moveably mounted on said body to move toward and away from said axis, at least one of said second jaws having a blade with an edge that extends substantially parallel to said axis, whereby a person can clamp the first jaws and pivot the body by 90° in opposite directions to form an approximately 360° circumferential cut in the insulation and then clamp the second jaws to cut the insulation longitudinally as the wire moves out of said hole.

4,117,750
SPINDLE ASSEMBLY FOR A PRECISION MACHINE TOOL

Fridrikh Lvovich Kopelev, ulitsa Komsomolskaya, 43, kv. 5; Valentin Vladimirovich Kossek, ulitsa Generala Petrova, 68, kv. 61; Askold Fedorovich Dubinenko, ulitsa Kosmonavtov, 13, kv. 8, and Semen Markovich Sherstinsky, ulitsa Artema, 22, kv. 10, all of, Odessa, U.S.S.R.

Filed Apr. 19, 1977, Ser. No. 788,939
Int. Cl.[2] B23B *19/02*; F16C *1/24*
U.S. Cl. 82—30 **6 Claims**

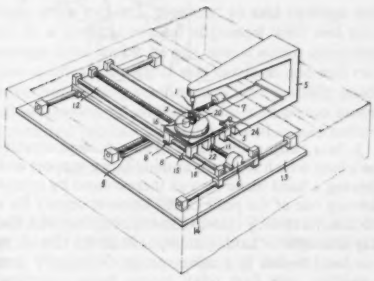


1. A spindle assembly for a precision machine, comprising: a housing having a front lid and a rear lid; antifriction bearings mounted inside said housing; a spindle mounted for rotation in said antifriction bearings within said housing, said spindle having a flange situated adjacent said front lid of said housing with a clearance left therebetween, said flange interacting with said front lid to define a first labyrinth seal; connecting means attached to said spindle and spaced from said rear lid for determining the relationship between said spindle and said housing, said connecting means interacting with said rear lid to define a second labyrinth seal; control means for controlling the effects of suction created within the clearance defined between said flange and said front lid by the rotation of the spindle, said control means preventing drawing-in of air from the ambient atmosphere into said housing through said second labyrinth seal, said control means including a passage, said passage having an inlet communicating with the ambient atmosphere, said passage further having an outlet communicating with said first labyrinth seal.

4,117,751
APPARATUS FOR INCISING ON A FILM THE PRECISE CONTOUR OF A REQUIRED IMAGE

Yoshio Inoue, No. 10, 2-chome, Tanabehigashino-cho, Higashisumiyoshi-ku, Osaka-shi, Japan

Filed Nov. 26, 1976, Ser. No. 745,118
Claims priority, application Japan, Dec. 26, 1975, 50/159507
Int. Cl.[2] B26D *3/08*
U.S. Cl. 83—868 **1 Claim**



1. In a precision instrument for incising on a film placed on a second surface of an output unit, the contour of an image located on a first surface of an input unit, each unit having a lower table with longitudinal guides, moveable in the longitudinal direction and an upper table with transverse guides disposed on said lower table moveable in the transverse direction and threaded drive shafts including servomotor drive means coupled to each table so that the location of the input unit upper table can be substantially reproduced with the output unit upper table, in combination:
(a) an arm **33** on said output unit with a vertical cutting needle **34** extending therefrom disposed for cutting a film placed on said second flat surface including solenoid means for raising and lowering said needle;
(b) an arm **5** on the input unit extending over said unit with a vertical light pen **1** moveable in the horizontal plane disposed thereon, said pen having an upper pen end held by said arm and a light emitting lower end for emitting light towards said input unit upper table;
(c) a glass plate **4** disposed between said input unit upper table and said light pen **1** said glass plate **4** serving to support the image whose contours are to be followed;
(d) a horizontally rotatable light receiving table **15** disposed on said input unit upper table under said light pen **1**, said rotatable table **15** including a lens **27** disposed over the table, photoelectric conversion units **2** disposed on said rotatable table for receiving said light, said table being adapted to rotate in such a way that the alignment of the photoelectric conversion units **2** is at right angles to the direction of the movement of said light pen **1**;
(e) hammer means **26** held by said arm **5** at said upper pen end and piezoelectric sensing elements disposed opposite said hammer; and,
(f) servo means coupled to said photoelectric conversion

units **2**, said piezoelectric sensing elements, and said servomotor drive to drive said light pen **1** over said contour and drive, said cutting needle **34** to follow the movements of said pen.

4,117,752

EMERGENCY SYSTEM FOR STOPPING A BAND BLADE OF A CUTTING APPARATUS

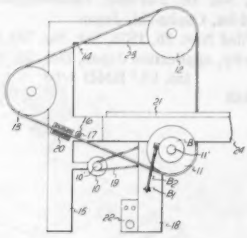
Kichi Yoneda, 396, Tsutsui, Nantan-cho, Mihara-gun Hyogo Prefecture, Japan

Filed Apr. 15, 1977, Ser. No. 787,939

Claims priority, application Japan, May 25, 1976, 51-67437[U]

Int. Cl.[2] B27G *19/00*

U.S. Cl. 83—58 **4 Claims**



1. In a cutting apparatus having pulleys rotatably mounted on a base which is in turn mounted on a support and the pulleys driving a band blade reeved therearound by means of a motor driving one of the pulleys and a power supply for said apparatus, an emergency system for stopping the band blade comprising an amplifier having an input in direct electric contact with the band blade, first relay means electrically coupled to the amplifier, said first relay means being electrically coupled between the power supply and the motor and operated for disconnecting said power supply and said motor when the amplifier receives and amplifies the electric charge potential of a human body only when the body contacts said blade, an electrically actuated brake mounted on said support and engagable with the driven pulley for braking the pulley, a further electrically actuated brake mounted on said base and engagable with said band blade for braking the band blade, and second relay means electrically coupled to the amplifier and electrically coupled between said power supply and said brakes and actuated to electrically connect said power supply and said brakes when the amplifier receives and amplifies the electric charge potential of a human body when the body contacts the blade.

4,117,753

SHEET CUTTING APPARATUS

William D. Friddle, Sr., Covington Rd., Greenville, S.C. 29609; William D. Friddle, Jr., Eastcliff Way, and Wilbourne D. O'Steen, 44 Smythe Ave. Dunean, both of Greenville, S.C. 29611

Filed Apr. 7, 1976, Ser. No. 674,373

Int. Cl.[2] B26D *5/08, 7/06*

U.S. Cl. 83—143 **3 Claims**

1. A cutting apparatus for severing a length of sheet material from a roll dispensing sheet material comprising:

a free standing cutting blade movable across said sheet material for severing the sheet material;

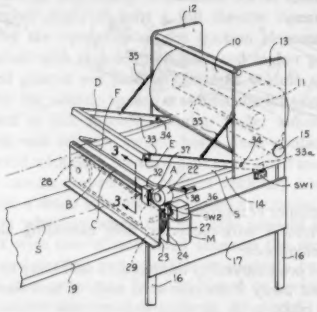
a base member beneath and extending across said sheet material;

a first open elongated channel in said base member through which said cutting blade extends into severing relation to the sheet material;

a pressure bar carried above said sheet material movable downwardly into holding engagement with said base member adjacent said open channel during severing movement of said cutting blade across said sheet material;

a second channel in said pressure bar opening opposite said first channel and in alignment therewith for receiving and shielding a free end of said cutting blade therein during severing movement of said cutting blade across said sheet material so that said pressure bar containing said second channel serves also as a guard for said cutting blade;

a spring biased pivoted arm depressible for carrying said pressure bar for arcuate movement into said holding engagement; and



a lifting bar spring biased upwardly over which said sheet material passes from said roll to said cutting blade, depressed by engagement with said spring biased pivoted arm during downward movement of said pressure bar and during severing movement of said cutting blade, and raised thereafter upon raising of the pressure bar and release thereby to lift a severed end of sheet material to facilitate further dispensing of sheet material from said roll.

4,117,754

TRANSVERSE CUTTER

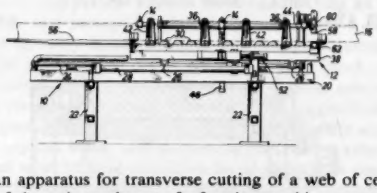
Jan-Olof Johansson, Höganäs; Heikki Korpela, Helsingborg, and Karel Spacek, Mörarp, all of Sweden, assignors to Gullfiber AB, Billesholm, Sweden

Filed Dec. 28, 1976, Ser. No. 755,019

Claims priority, application Sweden, Dec. 29, 1975, 7514724

Int. Cl.[2] B23D *25/04;* B26D *1/56*

U.S. Cl. 83—307.2 **2 Claims**



1. An apparatus for transverse cutting of a web of cellular plastic fed continuously out of a forming machine comprising:

a support stand;

a carriage means mounted for reciprocating motion on said support stand;

a plurality of cutting devices comprising mutually spaced hot filaments reciprocably mounted on and extending transversely across said carriage means;

means for moving said carriage means in successive synchronized traverses with said web and simultaneously moving said plurality of cutting devices perpendicular to the plane of said carriage; and

said means for moving said carriage means in successive synchronized traverses with said web moves said plurality

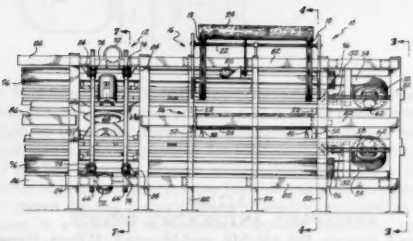
of cutting devices towards said carriage means from above said web and alternately moves said plurality of cutting devices away from said carriage means from below said web during successive synchronized traverses of said carriage means in the direction of motion of said web to divide said web transversely into separate lengths by means of said cutting devices.

4,117,755

LOG TRANSPORT AND SAWING SYSTEM

Earl Dean Hasenwinkle, and Frank Wislocker, both of Longview, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 13, 1977, Ser. No. 759,168
Int. Cl.[2] B27B *15/08, 24/08*
U.S. Cl. 83—435.1 **5 Claims**



1. An apparatus having an infeed end and an outfeed end for axially transporting logs through a work station, comprising:

means for positioning a log upstream from said work station and placing it in an aligned orientation where its center line is substantially in line with the axial path it will travel when being transported through said work station,

means for dogging and holding said log in its aligned orientation at a plurality of locations circumferentially spaced on each cross-sectional end of said log with said locations being substantially opposed and coaxial at opposite ends of said log and spaced outwardly from said center line, said dogging means including a plurality of dogging members extending inwardly toward the center line but terminating outwardly therefrom,

carriage means angularly spaced from one another for supporting said dogging and holding means as a log is transported axially through said work station from said infeed end to said outfeed end,

means at said work station for working on a traveling log at locations angularly spaced between said dogging and holding means,

means at said outfeed end for releasing the worked-upon log from said dogging and holding means, and

means for driving said carriage means axially from said infeed end to said outfeed end and back to said infeed end.

4,117,756

VERTICAL BAND SAW AND FEED TABLE

Gerald R. Harris, 1230 Camelia Dr., Livermore, Calif. 94550

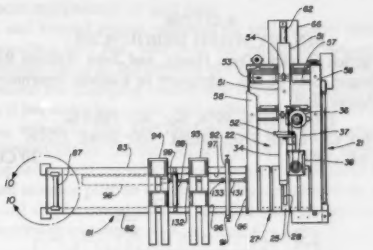
Filed Oct. 13, 1976, Ser. No. 732,107
Int. Cl.[2] B23D *53/04;* B27B *13/00*
U.S. Cl. 83—801 **1 Claim**

1. A band saw having a base formed with guideway means therein, a carriage including a saw frame and an arm rigidly secured thereto with said arm being mounted to said guideway means for reciprocal motion with respect thereto, a pair of wheels rotatably mounted to said saw frame, a band saw blade mounted to and distended between said wheels, blade drive means operatively connected to drive said saw blade, and carriage drive means operatively connected to drive said carriage to effect cutting of a work piece, wherein the improvement in said band saw comprises:

said arm is cantilevered from said carriage to extend away from a side of said saw frame remote from the side on which said saw blade effects cutting of said work piece;

said arm is formed with a hollow portion;

said guideway means is positioned on said base on a remote side of said frame from the side on which said saw blade effects cutting; and



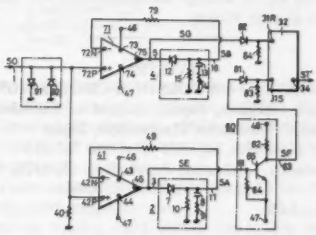
said carriage drive means is mounted to said carriage and said base in a position in axial alignment with said arm, said carriage drive means having piston means extensible therefrom to effect driving of said carriage, and said carriage drive means being positioned at least partially inside said hollow portion of said arm with said piston means being positioned substantially entirely within said hollow portion.

4,117,757

RECTANGULAR WAVEFORM SIGNAL REPRODUCING CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENTS

Keiji Akamatu, Takatsuki, Japan, assignor to Roland Corporation, Japan

Filed Feb. 14, 1977, Ser. No. 768,585
Claims priority, application Japan, Feb. 16, 1976, 51-16332
Int. Cl.[2] G10H *1/00;* H03K *5/13*
U.S. Cl. 84—1.01 **3 Claims**



1. A rectangular waveform signal reproducing circuit for electronic musical instruments, comprising:

a first charge-discharge circuit having a relatively small charge time constant and a relatively large discharge time constant for charging and discharging positive components of a monophonic signal;

a second charge-discharge circuit having a relatively small charge time constant and a relatively large discharge time constant for charging and discharging negative components of the monophonic signal;

first comparing means for comparing the monophonic signal with the output from the first charge-discharge circuit to produce a first compared output representing that the level of the former is larger than that of thelatter in the positive direction;

second comparing means for comparing the monophonic

signal with the output from the second charge-discharge circuit to produce a second compared output representing that the level of the former is larger than that of the latter in the negative direction; and

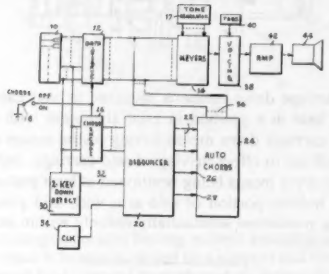
a flip-flop having first and second input terminals respectively supplied with the outputs from the first and second comparing means to produce a rectangular waveform signal having the fundamental period of the monophonic signal.

4,117,758

BINARY WORD DEBOUNCER

James Patrick Osburn, Terre Haute, and John William Robinson, Jasper, both of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Nov. 4, 1976, Ser. No. 738,754
Int. Cl.[2] G06F *3/02;* G10H *1/00;* H04L *15/06*
U.S. Cl. 84—1.01 **20 Claims**



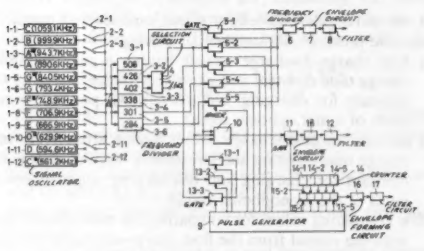
1. The method of compensating for the effect of switch bounce in a signal wherein the signal originates at a switch and is supplied to place of use, said method comprising: supplying the signal from the switch to the input side of a storage station which also has an output side, repetitively inserting the signal at the input side of the storage station into the station, comparing the signal in the storage station with the signal at the input side of the storage station, and supplying the signal in the storage station to said place of use at the end of a predetermined time delay period during which the signal supplied to the input side of the storage station remains the same as the signal in the storage station.

4,117,759

APPARATUS FOR FORMING CHORD SIGNAL

Hiroshi Kato, Okegawa, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Oct. 22, 1976, Ser. No. 735,213
Claims priority, application Japan, Dec. 17, 1975, 50-149433
Int. Cl.[2] G10H *1/00, 5/06*
U.S. Cl. 84—1.03 **5 Claims**



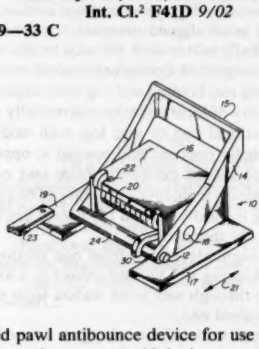
1. Apparatus for forming a chord signal comprising in combination: at least a frequency divider for root, a frequency divider for minor third, a frequency divider for major third and a frequency divider for fifth or a frequency divider for seventh, tone signal means connected to input terminals of said frequency dividers, the input terminals of said frequency dividers being connected together, the frequency divider for minor third and frequency divider for major third having a selection circuit for selectively taking out an output signal according to a major chord or a minor chord of music, the tone source signal from said tone source signal means being frequency-divided by the frequency dividers for root, minor third, major third and fifth or seventh for producing musical tone signals for chord, gate circuits, and a rhythm pulse generator, respective output terminals of the frequency divider for root, the selective circuit and the frequency divider for fifth or the frequency divider for seventh being connected together through respective ones of said gate circuits, said gate circuits having means for opening and closing said gates by an output pulse signal of said rhythm pulse generator.

4,117,760

FEED PAWL ANTIBOUNCE DEVICE

Charles J. Schertz, Bel Air, Md., and Dennis L. Wilson, Davenport, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 14, 1977, Ser. No. 787,407
Int. Cl.[2] F41D *9/02*
U.S. Cl. 89—33 C **6 Claims**



1. A feed pawl antibounce device for use in feeding rounds into an automatic weapon, said device comprising a feed pawl assembly and a feed tray,

said feed tray having a ledge upon which rounds are deposited for feeding into the receiver of said weapon,

said feed pawl assembly having a carrier movably mounted on said weapon,

a feed pawl pivotally mounted on said carrier for movement between a depressed position as said pawl passes under a round on said ledge, and a spring urged raised ready-to-feed position wherein said pawl moves said round from said ledge into said receiver, and

means retaining said pawl in said raised position as said pawl moves said round into said receiver,

said retaining means including a wall in said tray with a slot therein,

said slot having a ramp portion terminating flush with said wall, and

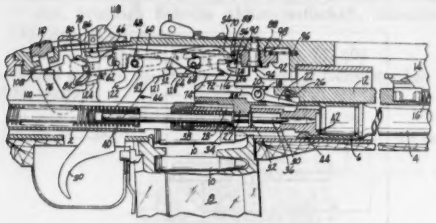
depressible means on said pawl engageable with said slot,

said depressible means being depressed by said ramp to free said pawl for pivotal movement as said carrier moves on said weapon.

4,117,761
FIRE CONTROL MECHANISM

James H. Johnson, New Haven; Arnold L. Fowler, Guilford; Julius E. Brooks, Branford, and Harvey H. Friend, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 31, 1966, Ser. No. 540,150
Int. Cl.[2] F41D *11/10*
U.S. Cl. 89—129 B 6 Claims

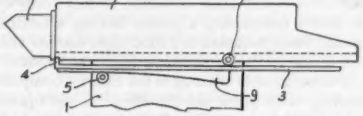


1. In a firearm; an operating rod disposed for reciprocation between a breech closed position and a recoil position in response to the cyclic rate of the firearm; sear means spring biased into a holding position for retaining said operating rod in a cocked position; trigger means pivotable into a firing position to release said sear from said holding position; counter cam means having a cam surface rotatably mounted in said firearm in a position to be rotated by said operating rod; a trigger bar mounted in said firearm for movement into one of three preselected positions, said preselected positions including an automatic position, a semi-automatic position, and a controlled burst fire position; selector means for moving said trigger bar into said preselected positions; said trigger bar in said semiautomatic position being out of contact with said sear means and engageable with said counter cam to prevent said counter cam from being rotated whereby a single round is fired with each pivot of said trigger means, in said automatic position being engageable with said counter cam to prevent rotation thereof and operable to be moved by said trigger means upon pivoting thereof to a position to cam said sear and prevent said sear from retaining said operating rod in a cocked position whereby rounds are continuously fired as long as said trigger means remains pivoted, in said controlled burst fire position being engageable with said cam surface of said counter cam to be moved upon rotation of said counter cam into a position to cam said sear and pevent said sear from retaining said operating rod in a cocked position whereby a predetermined number of rounds are fired upon pivoting said trigger means.

4,117,762
MACHINE TOOLS WITH SLIDING TOOL-HOLDING RAM

Michel E. Sachot, Orsay, France, assignor to Societe Hure S.A., Bagneux, France

Filed Jan. 30, 1976, Ser. No. 653,750
Claims priority, application France, Feb. 3, 1975, 75 03217
Int. Cl.[2] B23B *47/26;* B23C *1/00*
U.S. Cl. 90—11 F 12 Claims



1. In a machine tool of the type having a ram and support means mounting said ram for horizontal movement with respect thereto, said ram having an anterior portion for carrying the tool which overhangs the support means by varying amounts when the ram moves, means for providing an upward force to the overhanging anterior portion of the ram to counterbalance its weight and the weight of the tool carried thereby comprising:

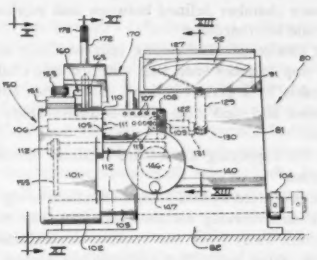
at least one bar having an anterior end coupled with the overhanging anterior portion of said ram, said at least one bar being mounted externally of said ram for horizontal movement with said ram and lengthwise pivotal movement independent of said ram;

first and second means mounted on said support means for engaging said bar, said first bar engaging means being located closer to the anterior portion of said ram than said second bar engaging means, said bar being carried on said first bar engaging means and under said second bar engaging means so that said engaging means apply oppositely directed forces thereto, whereby a rotational moment is applied to said bar which provides an upward force to said ram anterior portion to substantially counteract the downward displacement of said anterior portion produced by increasing overhang.

4,117,763
KEY DECODING AND DUPLICATING APPARATUS AND METHOD

Tim M. Uyeda, South San Gabriel, Calif., assignor to Klaus W. Gartner, La Palma, Calif.

Continuation-in-part of Ser. No. 582,639, Jun. 2, 1975, Pat. No. 4,012,991. This application Jul. 8, 1976, Ser. No. 695,317
Int. Cl.[2] B23C *1/16*
U.S. Cl. 90—13.05 11 Claims



1. Apparatus for duplicating a key having a shank portion with a plurality of spaced transverse notches of differing depths and spacing therebetween, said notches being coded to predetermined coded depth and spacing information therebetween, said apparatus comprising:

housing means including a card receiving slot for removably receiving card means therein;

coded indicia bearing card means removably and freely insertable into said slot in said housing means without connection to said housing means and having coded depth indicia thereon comprising a sequential index corresponding to at least a predetermined coded depth information for a singly type of key being duplicated;

blank key holding and positioning means mounted adjacent said housing means for holding a blank key having a blank shank portion in a predetermined relationship thereon;

notch cutting means mounted adjacent said housing means and adapted to cut a notch in said blank shank portion;

key moving means mounted adjacent said housing means and said holding and positioning means for moving said key having said blank shank portion into cutting engagement with said cutting means; and

indicating means provided within said housing means for continuously indicating the position of said notch cutting means and continuously indicating the depth of cut of the

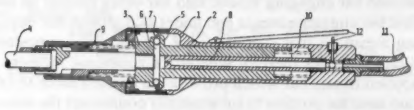
notches to be cut in said blank in comparison with said coded depth indicia on said card means.

4,117,764

VIBRATION ATTENUATING DEVICE

Göran Alfred Nilsson, Box 61, 820 22 Sandarne; Kjell Edström, Asbacksgatan 45, 826 00 Soderhamn, and Henry Wiklund, Backragen 1, 820 10 Arbra, all of Sweden

Filed Mar. 15, 1977, Ser. No. 777,727
Claims priority, application Sweden, Mar. 15, 1976, 032523
Int. Cl.[2] F01L *21/02;* **F01B** *15/02*
U.S. Cl. 91—50 **5 Claims**



1. A balanced two-mass system for attenuating vibrations in implements equipped with a fluid pressure operated impact mechanism, comprising:

a housing for supporting the implement;

a working member and a stop member movably mounted within said housing, said members being in axial alignment and being axially movable relative to one another; resilient means acting upon said

working member and said stop member for exerting a force on said working member in a direction towards said stop member and for exerting a force on said stop member in a direction towards said working member;

a pressure chamber defined between said working member and said stop member;

sealing means interconnecting said working member and said stop member such that said pressure chamber is deformable to a predetermined value when said working member and said stop member move apart from each other;

means for supplying a pressure medium to said pressure chamber;

the forces exerted by said pressure medium being effective to drive said working member and said stop member in a direction away from one another beyond said predetermined value such that said sealing means is broken, thereby reducing pressure within said pressure chamber, and resulting in movement of said working member and said stop member toward one another into their initial positions by said forces exerted thereon by said resilient means.

4,117,765

POWER SERVO CONTROL

Stanley R. Paduch, Somers, and Lawrence S. Smith, Simsbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 9, 1976, Ser. No. 748,981
Int. Cl.[2] F15B *9/03, 9/09, 13/16, 15/17*
U.S. Cl. 91—361 **7 Claims**

1. An electrohydraulic servo system comprising:

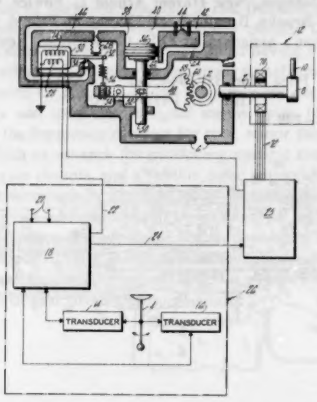
transducer means including a plurality of transducers associated with and responsive to displacement of a lever to produce a signal proportional to the displacement,

a torque motor actuated by said signal,

hydraulic means including a piston connected to a shaft and controlled by said torque motor to turn said shaft an amount proportional to the lever displacement,

a gear on said shaft,

an additional lever having a gear segment in mesh with said gear and connected to said piston to be moved thereby, and



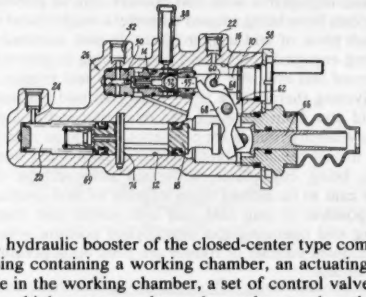
a feedback mechanism interconnecting the lever to the torque motor to apply a balancing force on the motor proportional to turning of the shaft.

4,117,766

HYDRAULIC BOOSTER

Gilbert Kervagoret, Argenteuil, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Oct. 15, 1976, Ser. No. 732,613
Claims priority, application France, Nov. 21, 1975, 75 35602
Int. Cl.[2] F15B *11/08, 13/04, 13/10*
U.S. Cl. 91—457 **1 Claim**



1. A hydraulic booster of the closed-center type comprising a housing containing a working chamber, an actuating piston slidable in the working chamber, a set of control valves comprising a high-pressure valve and an exhaust valve, the high-pressure valve being a ball valve having a seat and a ball valve member, said ball valve being situated between a high-pressure orifice adapted to be connected in use to a pressure fluid accumulator and an inlet compartment connected to the working chamber, tappet means controlling the ball valve under the influence of a lever mechanism according to the relative positions of the actuating piston and of a control rod projecting into the working chamber, the tappet means supporting the exhaust valve, said exhaust valve controlling the connection between the working chamber and an exhaust compartment, said exhaust valve being moved into its closed position before the ball valve opens upon actuation of said control rod, said tappet means comprising a sleeve having a central passage therein and being mounted in a fluid-tight manner across a wall separating the inlet compartment from the exhaust compartment, a valve element situated in the exhaust compartment and cooperating with a seat on the sleeve at the opening of the central passage so as to form the exhaust valve, and a sliding block which is mounted in a fluid-tight manner in a wall separating the exhaust compartment from the working chamber and said block cooperates with the valve element and lever

mechanism respectively, said sleeve, exhaust valve seat, sliding block and ball valve seat having effective cross sections, said sleeve effective cross section being equal to said exhaust valve seat effective cross section which is equal to the sum of said sliding block effective cross section and said ball valve seat effective cross section.

4,117,767

COMPRESSED AIR-OPERATED FASTENER DRIVER

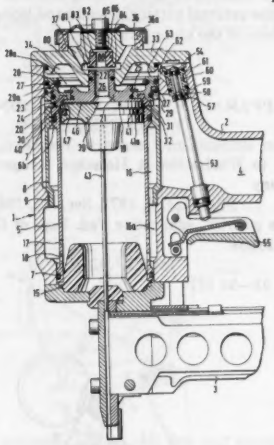
Wolfgang Elliesen, Ahrensburg, Fed. Rep. of Germany, assignor to Joh. Friedrich Behrens Aktiengesellschaft, Ahrensburg, Fed. Rep. of Germany

Filed Nov. 18, 1976, Ser. No. 742,904

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1976, 2601836

Int. Cl.[2] F15B *13/042*; B25C *1/04*

U.S. Cl. 91—461 **2 Claims**



1. A compressed air operated driver comprising, in combination, a casing, a cylinder defined within said casing having an axis and a control end, a piston reciprocally mounted within said cylinder, said cylinder, piston and control end defining a stroke chamber, a compressed air source, a manually operated first valve mounted on said casing communicating with said air source, a control valve mounted in said casing coaxial with said cylinder and defining said cylinder control end, said control valve being movable within said casing in the axial direction of said cylinder between first and second positions under the influence of said first valve, at least one port defined in said casing selectively communicating with said compressed air source and said stroke chamber, said control valve closing said port as said first position and opening said port at said second position, an exhaust port defined in said casing selectively communicating with said chamber, an exhaust valve movably mounted in said casing controlling flow through said exhaust port, said exhaust valve comprising an annular member in axial alignment with said control valve axially slidably movable within said casing, said exhaust valve including a first pressure surface and a second opposed pressure surface having a greater area than said first surface, a bore in said exhaust valve connecting said surfaces and an exhaust valve seat engaging said second surface whereby pressurized air exposed to said first surface biases said exhaust valve toward said control valve toward a position closing said exhaust port and pressurized air exposed to said second surface biases said exhaust valve in the opposite direction toward a position opening said exhaust port, said abutment selectively engaging said second surface during movement of said control valve from said first position to said second position an exhaust passage defined in said control valve communicating with said chamber and selectively communicating with said exhaust port, and an abutment defined on said control valve engaging said exhaust valve and closing said exhaust port upon said control valve moving from said first position to said second position, said exhaust valve closing said exhaust port until said control valve returns to said first position.

4,117,768

HYDRAULIC ROTARY DEVICES

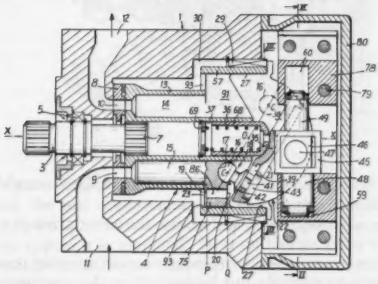
Robert Affouard, 3, rue R. Lanen, 92190 Meudon, France

Filed Apr. 9, 1976, Ser. No. 675,266

Claims priority, application France, Apr. 16, 1975, 75 11869

Int. Cl.[2] F01B *13/04*

U.S. Cl. 91—499 **5 Claims**



1. A rotary device with a cylinder barrel which can serve as a pump or as a motor, of the type comprising a stator enclosing a rotor with a cylinder barrel and an oblique plate which acts, by means of spherical head and seating assemblies, on the outer ends of a plurality of cylindrical pistons partially engaged in cylinders which are formed in the cylinder barrel and the geometrical axes of which are regularly distributed over a surface of revolution co-axial with said cylinder barrel, the portion of each piston which is adjacent to the corresponding spherical head and seating assembly being rigidly connected to a rigid supporting element which slides axially against the internal face of an external skirt, which skirt is rigidly connected to the cylinder barrel for rotation therewith and surrounds all those portions of all of the pistons which are outside the cylinders, wherein:

the said oblique plate is stationary and has a plane surface on which there slide shoes articulated on the piston by means of said spherical head and seating assemblies;

the spherical heads are rigidly connected to the said shoes and are each engaged in a matching spherical seating which terminates the outer end of the corresponding piston;

each supporting element extends between two planes perpendicular to the axis of the cylinder barrel and connected to the associated piston, each supporting element contacts said internal face of said external skirt between said two planes, the two planes consisting of a first plane which is spaced from the center of the spherical seating of the associated piston on the side opposite to the oblique plate, and a second plane which passes at least proximately to the center of the spherical seating, each supporting element forming part of a block bounded by two plane faces, by a portion of cylindrical surface on the side of the block opposite to the axis of the cylinder barrel and by another portion of a cylindrical surface on the side of the block closer to this axis, the block sliding in a recess of complementary shape formed in the cylinder barrel.

4,117,769

VACUUM BOOSTER

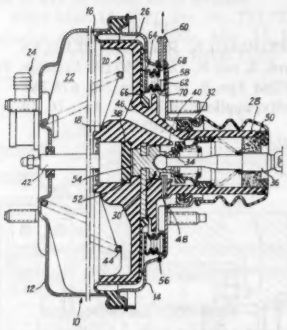
Jean-Jacques Carré, Montreuil, and Roland Levrai, Stains, both of France, assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 3, 1976, Ser. No. 747,459

Claims priority, application France, Dec. 10, 1975, 75 37751

Int. Cl.[2] F01B *7/00;* F15B *9/10;* F01B *19/00;* F16J *3/04*

U.S. Cl. 91—170 R **6 Claims**



1. A servomotor for providing an output force comprising:

a housing having a cavity therein:

a piston for separating said cavity into a first pressure chamber and a second pressure chamber;

an inlet control member responsive to an operator input for moving a control valve for controlling the communication of a fluid to said first pressure chamber, said fluid in the first pressure chamber developing a pressure differential between said first chamber and said second chamber, said pressure differential moving said piston from an idle position toward said second pressure chamber to produce a first output force; and

expandable means defining at least an auxillary chamber within said first chamber, said auxillary chamber being connected to an external pressure source, said expandable means being responsive to said external pressure source for moving into engagement with said piston and thereafter moving said piston from the idle position toward said second pressure chamber to develop a second output force independently of the operation of said inlet control member by the operator input.

4,117,770

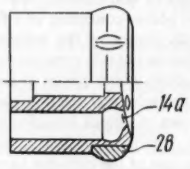
AXIAL-PISTON HYDRAULIC MACHINE

Gennady Petrovich Koshelenko, ulitsa Sovetskoi Militssi, 10, kv. 31, Odessa; Rafail Moiseevich Pasynkov, ulitsa Cheljuskinskaya, 8, kv. 46; Mikhail Alexandrovich Sin, Sevastopolsky prospekt, 44, korpus 4, kv. 264, both of Moscow, and Leonid Isaakovich Shemper, ulitsa Generala Petrova, 27, korpus 3, kv. 47, Odessa, all of U.S.S.R.

Filed May 13, 1976, Ser. No. 686,802

Int. Cl.[2] F01B *13/04*

U.S. Cl. 92—57 **2 Claims**



1. An axial-piston hydraulic machine comprising: a rotating cylinder block with axial bores; pistons reciprocating in said axial bores and enclosing working chambers in said bores; passages communicating some of the working chambers with a high-pressure space, other passages communicating the others of said chambers with a low-pressure space, said working chambers having minimum volume when said pistons are at their end positions, the surface of each of said working chamber in the end position of the respective piston being spherical and merging smoothly into a corresponding passage, said block having uniform wall thickness along the working chambers, the outside configuration of said block conforming to the inside shapes of the chambers, said block being of uniform strength construction, the external surface of said block having a corrugated form only in the zone of the working chambers where fluid compression occurs, the surface of said block being cylindrical in the zone of the piston bores; a reinforcing band attached to the external surface of said cylindrical block and located in the zone of said working chambers with a spherical surface, the external surface of said band being concentric with said surface of the chambers.

4,117,771

APPARATUS FOR FORMING BUNDLES OF FLATTENED BAGS

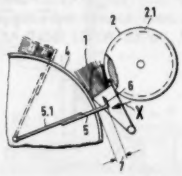
Friedhelm Brinkmeier, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 784,466

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1976, 2629064

Int. Cl.[2] B31B *1/98*

U.S. Cl. 93—93 HT **3 Claims**



1. Apparatus for forming bundles of flattened bags and successively transporting said bundles away, comprising a depositing table; a rotary depositing cylinder effective to deposit successive said bags edgewise on the depositing table, said table being disposed substantially radially with respect to said cylinder; resilient holding means for resiliently holding said deposited bags in juxtaposition substantially perpendicular to said table to form a stack and disposed laterally of said table and axially of said cylinder; and gripper means for separating a bundle from said stack of juxtaposed bags from said table and for lifting said separated bundle from said table, said gripper means being adapted to pass through a portion of said stack and said depositing table in a direction opposite to the direction of rotation of said cylinder so that said bundle of bags lifted thereby contains only part of said stack of juxtaposed bags on said depositing table, the length of said gripper means being adjustable to vary the size of said bundle lifted by said gripping means.

4,117,772

VENTED WINDOW ASSEMBLY FOR AUTOMOTIVE VEHICLES

Paul B. Specht, Wilmette, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 1, 1977, Ser. No. 773,434

Int. Cl.[2] B60H *1/24*

U.S. Cl. 98—2 **1 Claim**

1. A vented window assembly for use with automotive vehicles comprising, in combination:

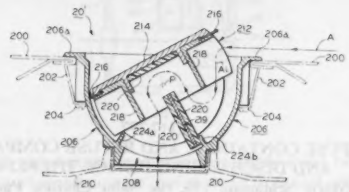
a window frame;

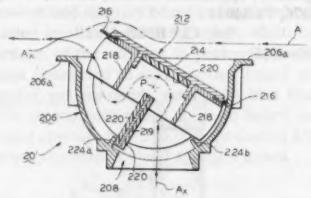
a substantially transparent window member fastened to said frame within the perimeter thereof;

a vent housing fixedly mounted between said frame and said window member and providing a passageway therein extending on opposite sides of said frame;

a vent member sealingly engaging and movable mounted within said passageway of said housing for selectively opening said passageway into a first direction along one side of said frame and into a second direction along said one side which is substantially opposite to that of said first direction, and to substantially close said passageway;

wherein said vent member is generally cylindrical and is pivotally mounted about its longitudinal axis within said vent housing and wherein said axis of said vent member is





substantially perpendicular to said first and second directions;

wherein the generally cylindrical portion of said vent member includes a flat portion extending substantially from end to end thereof and wherein the width of said flat portion is substantially equal to the width of said passageway at said one side of said frame whereby the surface of said assembly is substantially flush when said vent member closes said passgeway;

wherein said vent member includes first and second longitudinally extending openings along said generally cylindrical surface portion respectively disposed adjacent said flat portion along opposite sides thereof; and,

wherein said vent member includes a plurality of partitions extending radially inwardly from the inner walls thereof.

4,117,773

VENTILATION SYSTEM FOR THE SUPPLY OF AIR OR EXHAUSTION OF FUMES

William George Johnson, Hamilton, Canada, assignor to Crane Air Trac Incorporated, Burlington, Canada

Filed May 5, 1977, Ser. No. 793,789

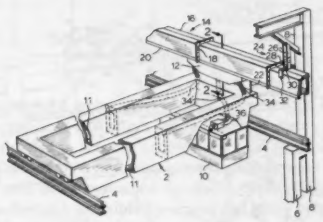
Int. Cl.[2] F23J *11/00*

U.S. Cl. 98—115 VM **33 Claims**

1. In a ventilation system of the kind wherein gases are transferred between a stationary trunking and at least one travelling tap movable longitudinally of the trunking, the trunking having a longitudinally extending opening and sealing means disposed so as normally to seal said opening, and the tap includes means locally to displace said sealing means so as to permit the transfer of gases between said trunking and said tap, the improvement wherein:

a. said seal comprises at least one and not more than two rows of elongated essentially planar metal strips, locating means on at least one side of the opening, the strips being individually located by said locating means in overlapping relationship with said opening and against displacement in their own plane longitudinally or laterally, and the strips as located being sufficiently flexible so as to be non-self-supporting in the longitudinal direction and sufficiently rigid in the lateral direction to support themselves and sustain forces due to differences in gas pressure within and without the trunking;

b. the seal displacement means comprises roller means carried by the tap and extending therefrom so as rollingly to engage said strips sequentially in each row as said tap travels relative to said trunking whereby locally to deflect a portion of at least one strip so engaged in each row out



of its sealing position to define an orifice into said trunking, the seal displacement means engaging the strips on their surfaces which sustain the lower gas pressure when the system is in use;

c. means extend from said tap towards said trunking to define a substantially enclosed passage between said tap and the orifice into said trunking defined by said at least one displaced flap portion;

d. said trunking is rigidly connected to longitudinally extending guide means; and

e. said tap includes means locating it in said guide means for movement longitudinally of the trunking in a defined relationship to the latter.

4,117,774

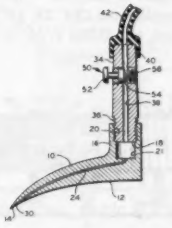
EGG SHELLER

Everett R. Wilburn, 1847 Princeton Dr., Toledo, Ohio 43614, and James A. Sorter, 6125 Windamar Rd., Toledo, Ohio 43611

Filed Mar. 25, 1977, Ser. No. 781,211

Int. Cl.[2] A47J *43/00*

U.S. Cl. 99—568 **5 Claims**



1. An apparatus for removing the shell from a previously cooked egg comprising a main body portion having a major surface thereof formed in the general configuration of a portion of the outer peripheral surface of an egg and terminating in a relatively thin leading edge for; insertion between a cracked egg shell and the cooked egg white;

fluid outlet means in the leading edge of said main body portion;

fluid passageway means providing communication between said outlet means and a source of pressure fluid; and

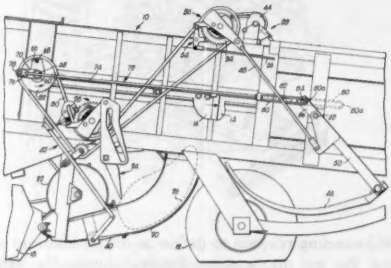
valve means in said passageway means for controlling the flow of fluid therethrough, whereby when pressure fluid is released through said outlet means the egg shell is removed from the associated cooked egg white.

4,117,775

TYING NEEDLE SAFETY CONTROL FOR CROP BALERS

Allen A. White, Peabody; George Yatcilla, and Cecil L. Case, both of Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed May 10, 1977, Ser. No. 795,616
Int. Cl.[2] B65B *13/08*
U.S. Cl. 100—19 R **9 Claims**



1. In a safety control arrangement for a baler where damage is prevented between the reciprocatory plunger and malfunctioned tying structure left in the path of travel of the plunger during the preceding tying cycle as a result of the drive train for the structure becoming inoperative, the improvement comprising:

means for withdrawing said structure from said path of travel,

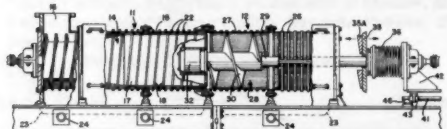
said withdrawing means including linkage shiftable during each operation of said plunger, which linkage has a lost-motion connection with said structure that is operable to effect said withdrawal when necessary, yet permits the structure to remain idle when it is out of said path of travel between tying cycles notwithstanding said operation of the plunger and said shifting of the linkage.

4,117,776

SCREW PRESS APPARATUS

Arthur J. Hunt, Ormond Beach, Fla., assignor to The French Oil Mill Machinery Company, Piqua, Ohio

Continuation-in-part of Ser. No. 771,905, Feb. 25, 1977, abandoned. This application Oct. 25, 1977, Ser. No. 844,711
Int. Cl.[2] B30B *9/16, 9/18*
U.S. Cl. 100—117 **7 Claims**



1. In a rotary screw press for expressing liquid from material and including a cage having means defining an elongated pressing chamber with an inlet end and a discharge end and having means defining fluid discharge openings extending through said cage, a rotatable screw in said chamber extending from said inlet and part way through said chamber and including an elongated body and a spiral flight projecting outwardly from said body, means for rotating said screw, means for compressing material within a first part of said chamber in response to rotation of said screw and forcing the material into a second part of said chamber beyond said screw, choke means controlling the flow of material through said discharge end from said second part of said chamber,

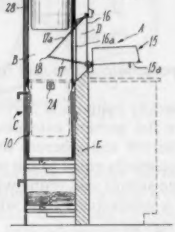
the improvement comprising an auger member normally located in said second part of said chamber and cooperating with said screw to form a plug of material of controllable density by correlating the rotational speeds of said screw and said auger member, means mounting said auger and said choke means for withdrawing movement as a unit in a direction lengthwise of said second part of said chamber, and means including a shaft for rotating said auger member separately from said screw.

4,117,777

REFUSE CONTAINER, AND REFUSE COMPACTING AND DISCHARGING DEVICE THEREFOR

Jean-Marie Schipman, 170, rue Saint Charles, Paris, France (75015)

Filed Jun. 1, 1977, Ser. No. 802,529
Claims priority, application France, Jun. 3, 1976, 76 16788; Nov. 30, 1976, 76 36011
Int. Cl.[2] B30B *15/30*
U.S. Cl. 100—215 **9 Claims**



1. A refuse, collecting, compacting and discharge system for use in a building, said system comprising:

a refuse chute positioned within an exterior wall of a building;

a refuse compacting assembly positioned within an upper portion of said refuse chute;

a refuse collecting assembly positioned within a lower portion of said refuse chute;

an insulating partition separating said refuse collecting assembly from the interior of the building, said insulating partition comprising framing defining hollow walls filled with insulating material;

an aperture communicating the interior of the building with said refuse chute at a position above said refuse collecting assembly, said aperture having a lower edge defined by a surface which is inclined inwardly and downwardly in a direction from the interior of the building to said refuse chute; and

a box-shaped trap adapted to receive refuse, said trap being hingedly mounted at said lower edge of said aperture such that said trap is pivotably movable between a first position closing said aperture and a second position extending into the interior of the building away from said aperture.

4,117,778

HIGH SPEED PRINTER WITH ARC PREVENTING FLUOROCARBON GAS

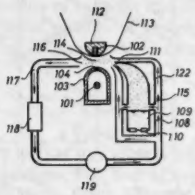
Akinori Watanabe; Katsuhide Tanoshima; Matsusaburo Noguchi, and Kinya Hattori, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 618,809, Oct. 2, 1975, abandoned. This application May 27, 1977, Ser. No. 801,206

Claims priority, application Japan, Oct. 30, 1974, 49/124270

Int. Cl.[2] H01T *19/04;* B03C *3/40*

U.S. Cl. 101—1 3 Claims



1. A high speed printer comprising an anode and a cathode respectively charged to cause ions to move from said anode to said cathode, an aperture board for modulating said ions, said aperture board enclosing said anode and having an aperture through which said ions may pass to be modulated, an ink mist located between said aperture board and said cathode such that said modulated ions combine therewith to electrically charge the ink particles of the ink mist to perform printing, and gas supply means connected to said aperture board to supply an electronegative gas consisting essentially of a fluoride compound to the region within said aperture board between said anode and said aperture board to prevent corona arc discharge and to prevent corrosion of said aperture board.

4,117,779

MEANS TO PROVIDE UNIFORM LENGTHWISE SQUEEGEE ANGLE OF ATTACK

Jacobus Gerardus Vertegaal, Boxmeer, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed Aug. 31, 1976, Ser. No. 719,240

Claims priority, application Netherlands, Sep. 3, 1975, 7510421

Int. Cl.[2] B41F *15/38, 15/44*

U.S. Cl. 101—120 5 Claims

1. In a rotary screen printing machine having a cylindrical stencil rotatably supported upon a frame and a squeegee device disposed within the cylindrical stencil, the squeegee device comprising a squeegee holder to which is attached a flexible squeegee blade such that a portion of the blade protrudes from the holder, the protruding portion of said blade having a trailing edge contacting the inner surface of said stencil in the region of the stencil contacting the material to be printed to define an angle with respect to the inner surface of the stencil, said squeegee device having ends and a central portion, and means on the printing machine acting upon said stencil for modifying the relative position of the inner surface of the stencil and trailing edge of the blade at the ends of the squeegee device to increase the angle at the ends of the squeegee device such that a uniform angle is obtained along the entire length of the blade.

4,117,780

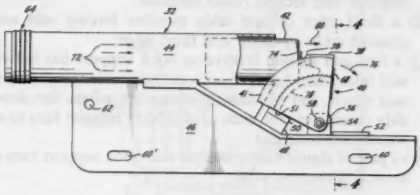
LINEAR EJECTION UNDERWATER CHARGE LAUNCHER

John C. Mollere, Nassau Bay, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Jun. 10, 1977, Ser. No. 805,267

Int. Cl.[2] G01V *1/08*

U.S. Cl. 102—22 R 8 Claims



1. In a ship-towed underwater charge launcher for ejecting cylindrical explosive cartridges into a body of water along a linear path for use in seismic exploration, said explosive cartridge being armed by a percussion-ignitable delay cap embedded therein and being propelled by water pressure from said towing ship, through a flexible hose, one end being attached to said ship, the other end trailing in the water, a detonator gun coupled to the trailing end of said hose, the detonator gun comprising:

an elongated cylindrical ejection barrel, having one end open to the water, for receiving an armed explosive cartridge from said flexible hose and for ejecting said cartridge into said body of water;

a rotatable, striker plate assembly, having a U-shaped rim, positioned adjacent the open end of said ejection barrel; and

a firing pin secured to said striker plate assembly for receiving the impact of said embedded percussion cap when said armed explosive cartridge first emerges from said ejection barrel.

4,117,781

UTILITY DESK

Charles A. Middleton, and Trudy B. Middleton, both of Phoenix, Ariz., assignors to TCM Corporation, Phoenix, Ariz.

Filed Jul. 5, 1977, Ser. No. 812,565

Int. Cl.[2] A47B *85/00*

U.S. Cl. 108—11 3 Claims

1. A portable utility desk, usable in a multiplicity of positions, including:

(a) a generally-rectangular, substantially-flat table member having a notch midway along an edge of said table member;

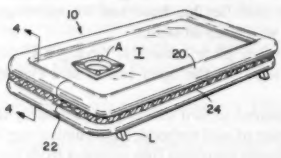
(b) a positionally adjustable leg member;

(c) first mechanical means for detachably connecting said leg member to said table member;

(d) a book support member on said table member above said notch, said book-support member including second mechanical means for preventing a book on said table member from sliding or falling;

(e) third mechanical means for preventing the pages of a book on said table from turning;
(f) a first and second longitudinal frame member, each said frame member having an L-shaped cross-section;
(g) said table member having first and second opposed edges approximately the length of said first and second frame members;
(h) said first edge abutting the internal angle of said first frame member and said second edge abutting the internal angle of said second frame member;
(i) a third edge of said table member having said notch situated midway along said third edge;
(j) a first and second transverse book support bar between said frame members and adjacent said table member above said notch, and mechanical connector means for detachably connecting the ends of said book support bars to said frame members; and
(k) a pair of elastic bands around said book support bars and stretched therebetween.

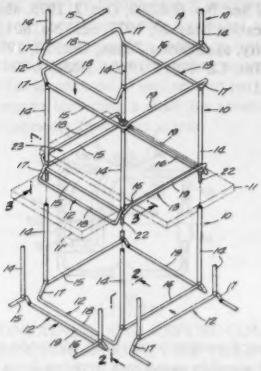
4,117,782
GUARD FOR PREVENTING HUMAN INJURIES ON IMPACT WITH FURNISHINGS
Richard C. Cahill, 3019 Oak Green Ct., Apt. F, Ellicott City, Md. 21043
Filed Jul. 29, 1977, Ser. No. 820,218
Int. Cl.[2] A47B *13/08*
U.S. Cl. 108—27 **7 Claims**



1. In a removable impact guard for preventing injury to humans on striking the edge of a table or the like, the improvement comprising: a pneumatic tubing flexible elongate member, means for detachably attaching the pneumatic tubing flexible elongate member with ends overlapped adjustably, in a loop around a table or the like including a flexible fastening strip secured along the pneumatic tubing flexible elongate member and having a portion thereof extending beyond the pneumatic tubing flexible elongate member, the flexible fastening strip having means thereon for fastening to itself when the pneumatic tubing flexible elongate member is in a loop around a table or the like, whereby the overlapped ends tend to fair in when pressure is applied on fastening of said strip.

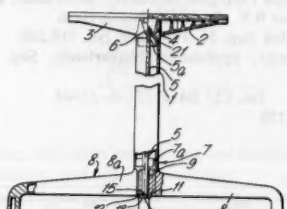
4,117,783
MODULAR STORAGE UNIT
Leonard B. Eckel, Helena, Mont.; James P. Sullivan, Tustin, and Elias D. Quintana, Huntington Beach, both of Calif., assignors to Design West Incorporated, Irvine, Calif.
Filed Dec. 2, 1977, Ser. No. 856,857
Int. Cl.[2] A47B *45/00*
U.S. Cl. 108—91 **4 Claims**

1. A storage unit in which a plurality of frame modules are interrelated to form an integral structure and include shelving members slidingly interconnecting the modules providing supportive storage, comprising:
each module including,
upper and lower open frames of identical generally rectangular configuration, having a first pair of parallel sides lying in one plane, a second pair of parallel sides lying in a second plane spaced from and parallel to the first plane, and slanting members interconnecting the ends of first parallel sides to the ends of the second parallel sides, studlike means affixed to each frame adjacent the junction of the slanting members and the respective first parallel sides, said studlike means all extending in the same direction, and a plurality of spacers, each spacer having first and second ends with openings therein;



said spacer openings being received onto the studlike means of the upper and lower frames, thereby holding the two frames in a fixed predetermined configuration.

4,117,784
DISASSEMBLABLE TABLE
Giancarlo Piretti, Bologna, Italy, assignor to Societa Anonima Castelli s.a.s. Di C. Castelli & C., Bologna, Italy
Continuation of Ser. No. 504,960, Sep. 11, 1974, abandoned, which is a continuation of Ser. No. 289,133, Sep. 14, 1972, abandoned. This application Jul. 26, 1976, Ser. No. 708,435
Claims priority, application Italy, Sep. 14, 1971, 52866 A/71
Int. Cl.[2] A47B *13/02*
U.S. Cl. 108—150 **3 Claims**



1. A disassemblable table structure comprising at least one vertical column, and at least one table top on one end of said column and a plurality of foot members having side walls and extending radially outwardly from the lower end of said column to support said column, each of said radial foot members being connected to said column by means of a removable base mounting comprising a plurality of groove joints circumferentially spaced from each other and adapted to engage complementary conical tapering male tongue joint members on the inner end of each foot member, and a vertical rod adapted to be inserted through said base mounting to connect said foot members and base mounting to said column, said plurality of groove joints of said base mounting including a number of circumferentially spaced female grooves which conically taper upwardly and have closed upper ends and open lower ends, and including a pair of recesses for each of said grooves extending from opposite sides of said grooves and facing outwardly of

said base mounting; said female grooves adapted to receive the male complementary shaped, conical tapering tongue joint members disposed at said inner end of each of said foot members, each of said tongue joint members further having two lateral male sector arms, adjacent said conical tapering male tongue joint member, which extend laterally beyond the side walls of said foot member so as to extend circumferentially about a substantial peripheral sector portion of said base mounting and are adapted to engage said recesses extending from opposite sides of said groove to ensure greater lateral stability of each foot member under a load on said table top; whereby with a plurality of bases for said columns employing the same or a different number of groove joints, tables of different designs can be structured to form in plan various polygonal shapes.

4,117,785

SAFE WITH RECESSED DIAL

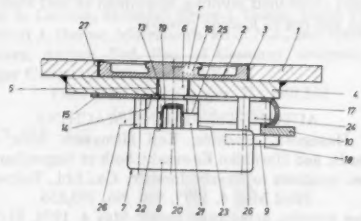
Erwin Drescher, Melsungen, Fed. Rep. of Germany, assignor to Melsunger Metall-Werk, Erwin Drescher, Melsungen, Fed. Rep. of Germany

Filed Apr. 27, 1977, Ser. No. 791,390

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705711

Int. Cl.[2] E05G *1/04*

U.S. Cl. 109—59 T 11 Claims



1. A safe with a safe door; a recessed dial in said door, a lock and a bolt system connected to said recessed dial; said recessed dial having a first portion movable for actuating said lock to an open position; means connected to said lock for releasing said bolt system from a blocked state when said lock has been actuated to the open position; means connecting said recessed dial to said lock for actuating said lock to said open position when said recessed dial is moved to a predetermined position corresponding to the open position of said lock; auxiliary bolt means connected to said lock and having means engaging said recessed dial, said recessed dial having forward and retracted positions, means connecting said lock and said auxiliary bolt means for disengaging said auxiliary bolt means from said recessed dial when said lock has been actuated to said open position; means connecting said lock and said bolt system for releasing said bolt system when said lock is in said open position; means mounting said recessed dial, said recessed dial being movable forward from said safe door in an axial direction of said dial after said auxiliary bolt means has been disengaged from said recessed dial by said lock, said recessed dial being movable in axial direction of said mounting means to the forward position from retracted position, said engaging means of said auxiliary bolt means engaging said recessed dial for inhibiting movement of said recessed dial to the forward position from the retracted position when said lock is in locked position; said auxiliary bolt means engaging said recessed dial when said lock is in locked position; said dial having a second movable portion; means connecting said dial to said bolt system for actuating said bolt system to an open position in said forward position of said dial by moving said second movable portion.

4,117,786

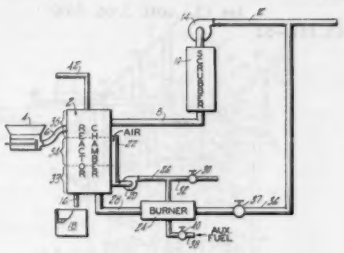
INLET AIR PREHEATING FOR PYROLYSIS SYSTEM

Harlan F. Brose, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 24, 1977, Ser. No. 800,113

Int. Cl.[2] F23L *15/00*; C10B *49/02*

U.S. Cl. 110—229 6 Claims



1. In a pyrolytic reactor,

a reaction chamber having a process gas outlet adjacent the top leading to a point of utilization of the process gas,

means for supplying air to the base of the chamber to promote combustion and a pyrolytic action in the chamber,

a burner in said air supplying means, and

a branch connection from said gas outlet to said burner in said air supplying means for mixing some of the process gas with the supplied air to be burned therein for raising the temperature of the entering air.

4,117,787

MACHINE FOR PERFORMING CULTIVATION UNDER PLASTICS

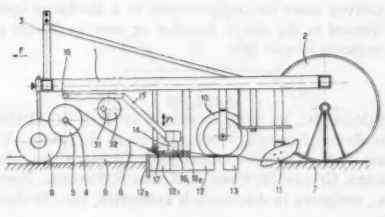
Jean-Paul Pavan, Monheurt Damazan, France

Filed Mar. 17, 1977, Ser. No. 778,426

Claims priority, application France, Sep. 20, 1976, 76 28212; Feb. 24, 1977, 77 05441

Int. Cl.[2] A01C *11/00*

U.S. Cl. 111—2 17 Claims



1. A machine for performing cultivation under plastics, comprising a framework, wheels for supporting said framework for rolling movement over the ground, a ploughshare supported on said framework to make a furrow in the ground, an axle supporting a roll of plastic sheet on said framework arranged to dispense said sheet toward the ground above the furrow, means supported from said framework for perforating the sheet before it reaches the ground, perforations being made in the sheet vertical to the furrow, a seat for an operator on said framework and a clamping tongue for clamping a seedling in the furrow, said tongue being secured to said framework beneath the sheet as it is dispensed onto the ground.

4,117,788

SEED DRILL INCLUDING DISCS DRIVEN BY GROUND WHEEL DRIVE

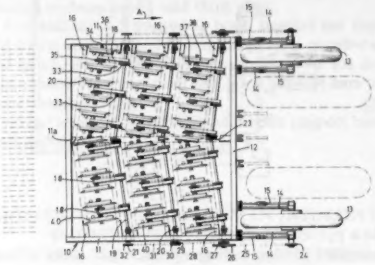
Edward Whitehead, Little Hill Farm, Dodwell, Stratford-upon-Avon, Warwickshire, England

Filed Apr. 6, 1977, Ser. No. 785,183

Claims priority, application United Kingdom, Apr. 7, 1976, 14088/76

Int. Cl.[2] **A01C** *5/06, 7/00*

U.S. Cl. 111—52 **16 Claims**



1. Seed sowing apparatus comprising:

(a) a plurality of rotatable ground-engaging discs arranged in two or more rows extending transversely of the direction of intended travel of the apparatus with the discs in each row laterally offset relative to those of the or each other row so that the discs in combination form a plurality of parallel grooves in the soil when the apparatus is in use;

(b) at least one ground-engaging wheel mounted to be driven by ground engagement as the apparatus is advanced;

(c) transmission means drivingly connecting said discs to said ground-engaging wheel so as to rotate said discs at a rate related to the ground speed of the apparatus; and

(d) associated with each such disc a respective seed metering device comprising:

(i) a hub member secured to the disc so as to rotate therewith;

(ii) a sleeve member encompassing the periphery of said hub member and held against rotation therewith; and

(iii) a seed receptacle affording an outlet effectively closed by said hub member, the hub member being formed or provided with a plurality of seed receiving pockets disposed at spaced intervals around its circumference so as to accept seeds from said outlet of the receptacle and convey same circumferentially to a discharge opening formed in the sleeve member or near its lowest point adjacent to said disc.

4,117,789

AUTOMATIC, IN SITU BOBBIN SPOOL LOADING

Herman Rovin, Norwalk, Conn.; Lawrence J. Levine, Valley Stream, N.Y.; Theodore Opuszenski, Darien, Conn.; Joseph Pellicano, Greenwich, Conn., and Alan F. Swenson, Norwalk, Conn., assignors to Automatech Industries, Inc., Bridgeport, Conn.

Filed Sep. 14, 1977, Ser. No. 833,178

Int. Cl.[2] **D05B** *57/26, 37/04, 45/00;* **H03K** *17/00*

U.S. Cl. 112—181 **17 Claims**

1. In an in-situ bobbin reloader of the type having

(a) means for rotating the bobbin spool at high speed,

(b) a feed tube movable into operative relation to said spool to guide thread onto said spool during reloading,

(c) means supplying a measured length of thread during reloading,

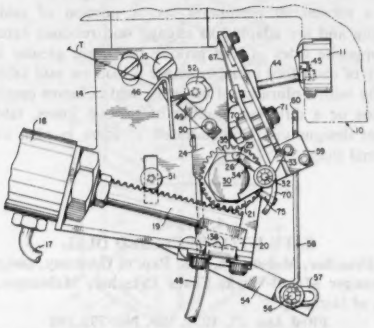
(d) a thread manipulator to engage the loaded thread under a bobbin tension spring, and

(e) means for severing the loaded thread, the improvement which comprises

(f) a mounting bracket for securing said reloader to a sewing machine,

(g) a support sleeve mounted on said bracket,

(h) a loading arm mounted on said sleeve for pivoting movement into and out of loading position and carrying said loading tube,



(i) a drive gear mounted on said sleeve and having a lost motion driving engagement with said loading arm, and

(j) an actuator mounted on said bracket and operatively associated with said drive gear for rotating the same to effect controlled pivoting movement of said loading arm into and out of loading position.

4,117,790

AUTOMATIC SEWING MACHINE

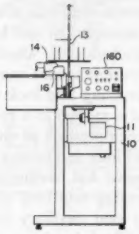
Yoshio Hasegawa, Machida; Koji Hiroyama, Gifu; Minoru Shimada, and Haruhiko Kawasaki, both of Sagamihara, all of Japan, assignors to Kayaba Industry Co., Ltd., Tokyo, Japan

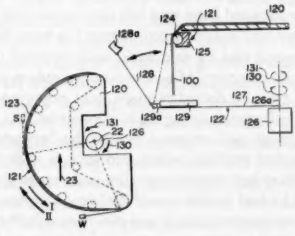
Filed May 4, 1977, Ser. No. 793,856

Claims priority, application Japan, May 4, 1976, 51/51204

Int. Cl.[2] **D05B** *27/14*

U.S. Cl. 112—205 **7 Claims**





1. An automatic sewing machine for successively sewing

contiguous edges of a workpiece which extend at angles with respect to each other, said machine comprising:

a table having an upper surface for supporting a workpiece to be sewn;

a sewing needle located at a position fixed with respect to said table for sewing successive contiguous edges of the workpiece;

means for advancing the workpiece over said table in a sewing direction such that a given edge of the workpiece is maintained in a predetermined position with respect to said sewing needle;

said table having at least one arcuate side face dimensioned such that a portion of the workpiece opposite the edge thereof being sewn hangs down over and slidably engages said arcuate side face; and

feed mechanism means, positioned adjacent the bottom of said table and extending substantially along the contour of said arcuate side face thereof, for frictionally engaging the portion of the workpiece hanging down over said arcuate side face of said table, and for, upon completion of sewing of one edge of the workpiece, turning the workpiece with respect to said table until the workpiece is positioned such that the next adjacent contiguous edge of the workpiece is aligned with said sewing direction.

4,117,791

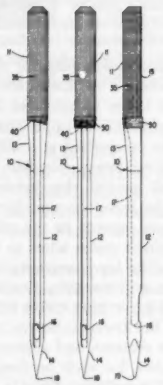
DUAL COLOR CODED SEWING MACHINE NEEDLES

Wayne A. Current, Holmdel; Bruce I. Genge, South Plainfield; Herbert J. Hurme, Morristown, all of N.J., and Josef Zocher, Haaren, Aachen, Fed. Rep. of Germany, assignors to The Singer Company, New York, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,343

Int. Cl.[2] D05B *85/00*

U.S. Cl. 112—222 **4 Claims**



1. A sewing machine needle having a shank portion adapted to cooperate with the needle clamp on a sewing machine needle bar, a blade portion formed with a needle eye and a thread accommodating groove extending from said eye at substantially uniform depth along said blade, and a shoulder portion at the juncture of said shank and blade portion, a dual color coding system comprising a a first color coded area of uniform color having predetermined correlation to a first characteristic of said needle and provided by a dye which leaves no discernable surface coating, said first color coded area extending on said needle shank, and a second color coded area of uniform color having predetermined correlation to a second characteristic of said needle and provided by a layer of opaque material applied as a surface coating on said needle shoulder.

4,117,792

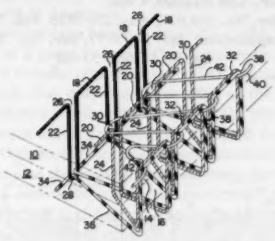
OVEREDGE STITCH FORMATION

Gerald S. Navlyt, Woodstock, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed Aug. 31, 1977, Ser. No. 829,303

Int. Cl.[2] B32B *31/00;* **D05B** *1/20*

U.S. Cl. 112—433 **4 Claims**



1. An overedge stitch comprising;

a pair of upper threads formed into two fabric penetrating thread loops which project through a workpiece at spaced intervals;

a looper thread passing through the bight portion of one of said thread loops and around the bight portion of the other thread loop; and

a thread formed into a corresponding thread loop passing through the bight portion of said other thread loop and the bight portion of said looper thread and extending for subsequent penetration by a fabric penetrating thread loop whereby forming an overedge stitch.

4,117,793

POLE CLAW MEMBER FOR A DYNAMO ELECTRIC MACHINE ROTOR

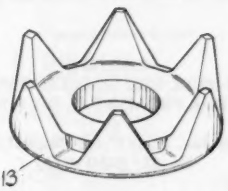
Kenneth Preece, Solihull, and Walter Graham Cheary, Birmingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Mar. 21, 1977, Ser. No. 779,661

Claims priority, application United Kingdom, Apr. 7, 1976, 14040/76

Int. Cl.[2] B21D *53/26*

U.S. Cl. 113—116 D **16 Claims**



1. A method of manufacturing a pole claw member including the steps of:

(a) bending an elongate strip of ferrous material, having one of its long edges generally plain and its opposite long edge serrated, to form a cylinder, whereby one axial end of the cylinder is generally plain and the other axial end of the cylinder is serrated, with the serrations extending axially of the cylinder and being equal in number to the number of claws of the member to be manufactured;

(b) interconnecting the ends of the strip; and

(c) utilizing mating dies to deform the generally plain end of the cylinder to produce an annular base extending in a

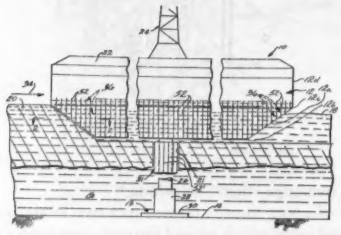
plane generally at right angles to the axis of the cylinder and to shape the serrations to the desired claw shape.

4,117,794

ICE MELTING SYSTEM AND METHOD

Charles Norman Sjogren, San Gabriel, Calif., assignor to Global Marine, Inc., Los Angeles, Calif.

Division of Ser. No. 609,030, Aug. 29, 1975, Pat. No. 4,075,964.
This application Apr. 11, 1977, Ser. No. 786,239
Int. Cl.[2] B63B *35/08*
U.S. Cl. 114—40 **25 Claims**



1. A method of melting a solid layer moving toward an object having an exterior thermally conductive surface in the path of movement of the layer, the method comprising the steps of:

disposing in the path of movement of the layer a section of said exterior surface having surface indentations configured and arranged such that said exterior surface includes a plurality of elongated, spaced apart front portions which confront the moving layer and a plurality of elongated, spaced apart recessed portions which are located remotely from the layer relative to said front portions of the exterior surface, the recessed portions extending from the region of the surface proximately adjacent the portion of the layer to be melted to a location above the top surface of the layer;

directing heat outwardly from said exterior surface to a portion of the layer located proximately adjacent said surface to melt the layer; and

continuously maintaining a force between said exterior surface and the adjacent portion of said layer to maintain heat transfer between said surface and said layer;

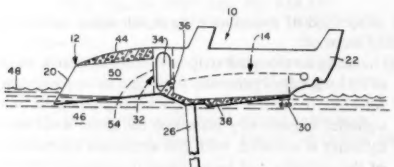
the recessed portions of said surface providing areas of heat concentration plus acting as conduits for removing melted material from the interface between said surface and said layer.

4,117,795

MULTI-HULL SELF RESCUING SYSTEM

Carlos Santiago Ruiz, PROMSA P.O. Box 1478, San Salvador, El Salvador

Filed Jun. 17, 1977, Ser. No. 807,633
Int. Cl.[2] B63B *43/10*
U.S. Cl. 114—68 **20 Claims**



1. A method of inverting a marine craft having air entrapped therein while floating in a capsized condition on a body of water, comprising the steps of: pivotally connecting an elongated boom to the capsized craft; suspending a counterweight from said boom substantially immersed in the water to establish a rotational axis for the craft; venting air entrapped in the craft to admit water therein causing angular displacement in one direction about said rotational axis until the craft reaches a stabilized intermediate position; and pivotally displacing the boom relative to the craft to raise the counterweight out of the water causing continued angular displacement in said one direction from the intermediate position until the craft is floating in an upright position.

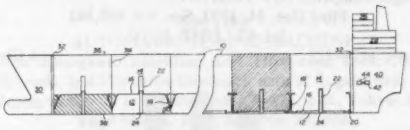
9. In combination with a marine craft having a keel extending between bow and stern ends, apparatus for inverting the craft from a capsized position in water to an upright position, including buoyancy support means mounted within the craft intermediate said bow and stern ends for establishing a rotational axis about which the craft is angularly displaceable between the capsized and upright positions, flotation means restrictively mounted by the craft on opposite sides of the rotational axis for enabling angular displacement of the craft relative to said rotational axis, and means for inducing said angular displacement.

4,117,796

DOUBLE SECTIONED TANK

Patrick J. Strain, 27 Tanglewood Dr., Ottawa, Ontario, Canada (K2H 6P5)

Filed Aug. 1, 1977, Ser. No. 820,703
Int. Cl.[2] B63B *25/12*
U.S. Cl. 114—74 R **14 Claims**



1. A fluid cargo and ballast tank for the cargo and ballast space of a ship, wherein a vertically movable rigid partition being the top of the lower section and bottom of the upper section divides the space into an upper and lower section, each section to be used to carry fluid at a different time than the other and the partition being movable between upper and lower positions and guided therebetween by appropriate means, the top of the lower section further having a rigid, peripheral top portion secured to the edge of the tank with which the rigid partition mates when in its upper position to provide a rigid top of the lower section extending from wall to wall of the tank, an impermeable, flexible sheet of material secured to the movable partition and to the rigid peripheral top portion of the top of the lower section to prevent fluid communication between the sections, and appropriate fluid inlets and outlets being provided for each section, whereby different fluids can be carried at different times in each section in substantially the same physical space, while not allowing any intermingling between the residues of the fluids from one section to the other.

4,117,797

MAST AND KEEL MOVEMENT FOR SAILING VESSELS

Hartleigh Kelly, 3 Weewanda St., Glenelg South, Australia (5045); Bruce A. Kelly, 54 Kauri Parade, Seacliff, Australia (5049), and Ross A. Kelly, 2A Clearview St., Beaumont, Australia (5066)

Filed Mar. 16, 1977, Ser. No. 778,090
Claims priority, application Australia, Apr. 1, 1976, PC5451
Int. Cl.[2] B63B *15/00*
U.S. Cl. 114—91 **3 Claims**

1. A sailing vessel comprising:

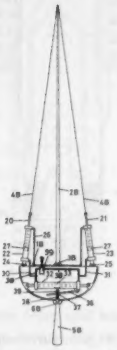
a hull,

a mast upstanding from said hull and connected thereto to be free to tilt on said hull about an axis arranged longitudinally of said hull,

a keel depending from said hull and connected thereto to be free to tilt on said hull about an axis also arranged longitudinally on said hull, and

means interconnecting said mast and said keel to cause rotation about said axes in the same sense,

said interconnecting means being hydraulic and comprising a pair of oppositely acting actuators connected to said mast to displace hydraulic fluid in proportion to mast movement about said hull, lines from said actuators to a



further hydraulic actuator which is connected to said keel, said further actuator receiving displaced fluid from said oppositely acting actuators to transmit mast movement to said keel about said hull, and means to by-pass fluid from one side to the other side of said further actuator to vary the relative angle of said keel to said mast,

said keel having sufficient weight to hold said mast upright but allowing it to deflect leeward about said hull under wind pressure, said keel balancing said leeward deflection by tilt to windward, whereby the tilt of the mast is balanced by said keel and said hull does not necessarily deflect.

4,117,798

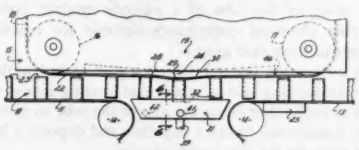
APPARATUS FOR TREATING EDGE-BEAD FORMATION

James W. Cornelius, and Robert T. Mallon, both of Cincinnati, Ohio, assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 709,504, Jul. 28, 1976, Pat. No. 4,020,198. This application Jan. 10, 1977, Ser. No. 757,916

Int. Cl.[2] B05C *3/02, 3/10, 11/08*

U.S. Cl. 118—4 **8 Claims**



1. In apparatus for applying a free-flowing, hardenable coating material to an inverted metal can, said apparatus being of the type in which the coating material is sprayed onto the inverted can, flows downwardly and accumulates as a bead at a lower edge of the can, the can after spraying on a coating belt is transferred by an overhead transfer conveyor from the coating belt to an oven belt which carries the can into an oven wherein the coating material is hardened, and said transfer conveyor has can lifting and holding means associated with it for lifting cans off the coating belt and holding them suspended;

means for eliminating an excessively thick bead of coating material on said lower edge, said means comprising,

a tank containing a pool of thinner for said coating material, said tank disposed between the coating conveyor and the oven conveyor,

means for maintaining the surface of said pool at a predetermined level in operation,

the transfer conveyor being positioned to dip the can into the pool at a point before said coating material has hardened, said transfer conveyor thereafter moving the can on a path such that only the lower edge of the can and the bead thereon are below the surface of the pool, said transfer conveyor moving said can on said path for a sufficient distance that the thinner in said pool dissolves and substantially removes the coating material from the lower edge,

said transfer conveyor further arranged to lift the can from said pool before said coating material has hardened on the can above said lower edge,

the can lifting and holding means holding the can in essentially vertical position at its point of deepest immersion so that the lower edge is uniformly immersed in said thinner, said can lifting and holding means holding the can after it has been lifted from the pool, at an angle which is substantially vertical so that unhardened coating material remaining on the can will flow downwardly substantially uniformly,

the can lifting and holding means releasing the can onto the oven belt for carrying it into said oven,

the position at which said can lifting and holding means lifts the can from the pool being spaced sufficiently from the oven that unhardened coating material on the can above said lower edge will in operation flow downwardly and recoat said lower edge but without forming an undesirable bead, before said coating material is hardened.

4,117,799

APPARATUS FOR COATING BLANKS OR THE LIKE FORMED OF TEXTILE MATERIAL, ESPECIALLY CLOTHING INSERTS

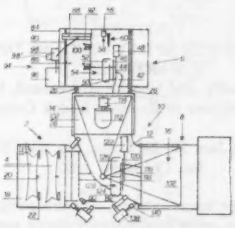
Zdenek Koula, Regensdorf; Peter Nirk, Walchwil, and Hans Wullschleger, Zurich, all of Switzerland, assignors to Stots & Co. AG, Zurich, Switzerland

Filed Feb. 10, 1977, Ser. No. 767,494

Claims priority, application Switzerland, Feb. 13, 1976, 1797/76

Int. Cl.[2] B05C *13/02*

U.S. Cl. 118—6 **55 Claims**



1. An apparatus for automatically, at least zone-wise, coating blanks, especially clothing inserts, formed of textile material, comprising:

a device for the successive exact positioning of at least one blank;

a coating device for the successive, at least zone-wise, coating of at least one blank;

a heating device for the thermal treatment of the coated blanks;

a conveyor device for the exact aligned transfer of the blanks from one device to the other; said conveyor device comprising: distributor chamber means;

blower means including a suction side;

means for connecting the distributor chamber means the suction side of the blower means;

a perforated plate serving to receive at least one blank and forming a wall of said distributor chamber means;

said perforated plate having a proportion of perforations amounting to at least 10 percent of the surface area of said perforated plate.

4,117,800

DEVICE FOR SPREADING GLUE

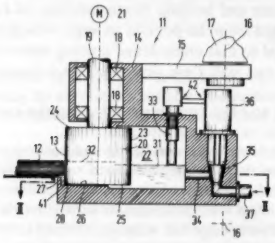
Dieter Maus, Neuffen, and Hermann Buck, Huelben, both of Fed. Rep. of Germany, assignors to Bielomatik Leuze & Co., Neuffen, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,702

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1976, 2652133

Int. Cl.[2] B05C *1/02*

U.S. Cl. 118—7 **16 Claims**



1. A device for spreading glue on articles such as the abutting ends of stacks of sheet paper or book backs, comprising:

a glue tank, a rotatable glue-spreading roller which projects into the glue tank and is arranged, in use, to project from above into a glue supply in the glue tank and be wetted with glue, wipers being arranged to act on the surface of the glue-spreading roller in the regions where the glue-spreading roller enters and leaves the glue tank, and a level regulating device for maintaining a desired glue level with a free upper glue surface in the glue tank, whereby the glue-spreading roller may be wetted with glue over only a part of its axial length, the extent of wetting being determined by the glue level in the glue tank.

4,117,801

APPARATUS FOR SPRAY COATING DISCRETE PARTICLES

Clarence C. Dannelly, and Charles R. Leonard, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 10, 1976, Ser. No. 694,757

Int. Cl.[2] B05C *5/00*

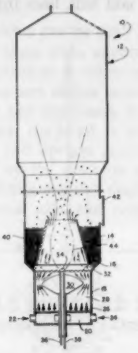
U.S. Cl. 118—20 **4 Claims**

1. Apparatus for spray coating discrete particles in which upwardly flowing gases continuously move particles from a storage zone, lift them into a coating zone through an atomized spray of liquid coating material for coating of the particles individually, further lift the particles into a drying zone and further separate the particles for solidification of the coating on the particles and still further lift the particles into a deceleration zone for return to the storage zone and subsequent recirculation through the zones, the apparatus comprising:

a hollow column;

a tapered hollow member being open at both ends and being mounted within said hollow column with its larger open end being adjacent one end of said hollow column to form a storage zone for the particles between the inner wall of said hollow column and the outer wall of said tapered hollow member and to form therewithin the coating and drying zones, and to form adjacent its smaller open end in said hollow column the deceleration zone;

a gas plenum assembly for supplying flowing gases to said one end of the hollow column, said gas plenum assembly including an aerodynamic gas shaping structure means for shaping the flowing gases to direct them into and through said tapered hollow member in such a manner as to create



a reduced pressure region surrounding said flowing gases to pull the particles from the storage zone and entrain the particles in said flowing gases to transport them through said tapered hollow member and into the deceleration zone in said hollow column for return by gravity into the storage zone;

and a spray assembly for spraying the liquid coating material into the flowing gases immediately downstream of said aerodynamic gas shaping structure means to coat said particles as they are transported through the coating zone by the flowing gases.

4,117,802

METHOD AND DEVICE FOR DEPOSITING A LAYER OF GLASS ON THE INNER WALL OF A TUBE

Christian Le Sergent, Marcoussis, and Michel Liegois, Paris, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Aug. 24, 1977, Ser. No. 827,273

Claims priority, application France, Sep. 9, 1976, 76 27073

Int. Cl.[2] B05C *7/04*

U.S. Cl. 118—48 **6 Claims**

1. A device for depositing a layer of glass on the inner wall of a tube constituted mainly of silica, said device comprising:

means for causing a flow inside said tube, from one end to the other of the tube of a gaseous mixture containing volatile chemical compounds suitable for reacting together to form said glass;

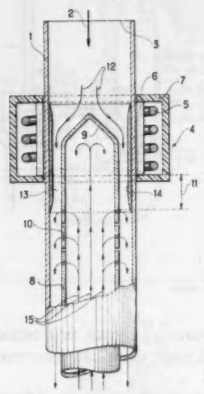
means for heating said tube along a part of its length;

means for moving said tube and said heating means in relation to each other along the axis of the tube so as to cause said compounds to react together and deposit a layer of said glass on the inner wall of tube;

a cylindrical element disposed inside said tube, said cylindrical element being fixed in relation to said heating means, the tube and the cylindrical element being coaxial, a first end of the cylindrical element being situated in the vicinity of the zone heated by said heating means, the second end of the cylindrical element being situated downstream from said zone in relation to the flow direction of said gaseous mixture, said cylindrical element defining between its outer cylindrical surface and the inner wall of

the tube a space in which said gaseous mixture is channelled,

said cylindrical element being tubular along the greater part of its length, said cylindrical tubular element being closed at one of its ends and including a plurality of orifices passing through its cylindrical wall, said orifices being



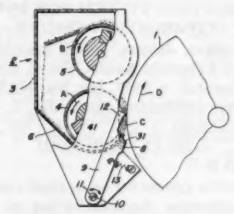
situated downstream from said heating zone, and wherein the device includes means for injecting a cooling gas in said cylindrical tubular element by its other end in order to cool said element, the cooling gas being neutral in relation to the volatile chemical compounds, the cooling gas passing through said orifices to mix with said first gas.

4,117,803

DEVELOPER FLOW REGULATOR FOR A MAGNETIC BRUSH DEVELOPING DEVICE

Hidetoshi Kito, Ebina, Japan, assignor to Rank Xerox, Ltd., London, England

Filed May 3, 1977, Ser. No. 793,456
Claims priority, application Japan, May 17, 1976, 51-055438
Int. Cl.[2] G03G *15/09*
U.S. Cl. 118—658 **4 Claims**



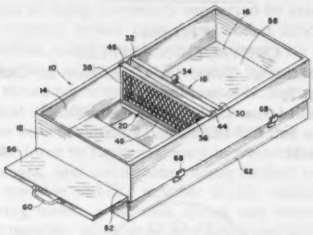
1. In a magnetic brush developing device for developing an electrostatic image on an electrostatic latent image bearing member with developer formed into a brush-like configuration on a developing roll the improvement comprising a developer discharge-regulating plate for regulating the amount of the developer on said developing roll as a function of the clearance between said roll and said member wherein said plate is carried by a pair of arms, said arms are mounted for pivotal movement toward and away from said roll in response to the distance between said roll and said surface.

4,117,804

SELF-DEODORIZING LITTER BOX

Ray G. Moore, and William M. Coffman, Jr., both of Tulsa, Okla., assignors to Ivan Pope, Tulsa, Okla., a part interest

Filed Apr. 15, 1977, Ser. No. 787,747
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—1 **5 Claims**



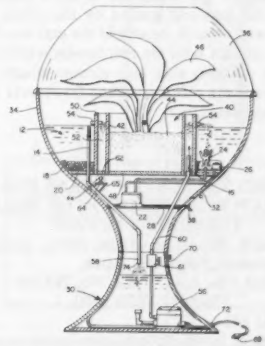
1. A pet litter box comprising at least two open compartments for receiving a quantity of litter therein, a closed compartment disposed beneath the open compartments, independent removable floor plate means provided for each open compartment and interposed between the open compartment and the closed compartment, said floor plate means being movable between open and closed positions to provide selective communication between the open compartment and the closed compartment, removable partition means interposed between said open compartments to provide a positive separation therebetween, and filter means interposed between said open compartments for cleaning any litter moving from one open compartment to the other open compartment.

4,117,805

VIVARIUM

Nazareen Ward, Oakland, Calif., assignor to Elizabeth Ward; John Tribble; Lee Gordon and Frank Irving, all of Oakland, Calif.

Filed Dec. 3, 1976, Ser. No. 747,430
Int. Cl.[2] A01K *64/00*
U.S. Cl. 119—5 **10 Claims**



1. A vivarium comprising:

a. an aquarium having a water outlet and a water inlet;

b. a terrarium having walls forming a solids retaining space, a portion of said terrarium positioned within said aquarium, said terrarium walls structurally connected with the structure of said aquarium;

c. a shield surrounding said terrarium walls and forming an expansion chamber therebetween, said shield substantially rigidly selectively mounted to said aquarium and connected terrarium, said shield providing access between

said aquarium and said chamber by means for providing an opening through said shield, said means being positioned at a higher level than said aquarium outlet, said means serving as said aquarium inlet;

d. pump means for providing circulation of the aquarium water collected from said aquarium outlet to said aquarium inlet.

4,117,806

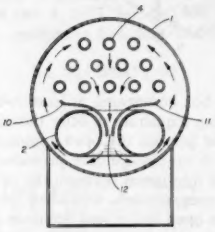
CONVECTION BAFFLES

William P. Manning, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 25, 1976, Ser. No. 699,778

Int. Cl.[2] F22B *1/02*; F22D *7/00*

U.S. Cl. 122—33 **4 Claims**



1. In an indirect heater comprising a horizontally extended shell within which a heat source is mounted to extend horizontally through a substantial length of the lower volume of the shell and a coil bundle is mounted to extend horizontally through a substantial length of the upper volume of the shell and the remainder of the shell volume being filled with liquid, wherein, the heat source is in the form of a return-bend firetube with both legs at substantially the same height above the bottom of the shell, and including,

a baffle plate extended longitudinally and parallel closely above and substantially the length of each leg of the firetube with a substantial portion of its transverse dimensions inclined at an acute angle to the vertical with the plates diverging from each other,

whereby those portions of the liquid body directly above each leg and on the underside of each baffle plate are heated by the legs and guided by the plates into rising streams flowed around the side of the coil bundle and then into direct contact with the coil bundle which cools them so that the portions sink in a stream which is directed down between the plates and then flows over the legs for reheating and recycling.

4,117,807

FUEL INJECTION CUT OFF MEANS FOR OVER TEMPERATURE PROTECTION OF EXHAUST TREATMENT DEVICE

Daniel D. Barnard, Farmington Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 2, 1977, Ser. No. 765,019

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EE **8 Claims**

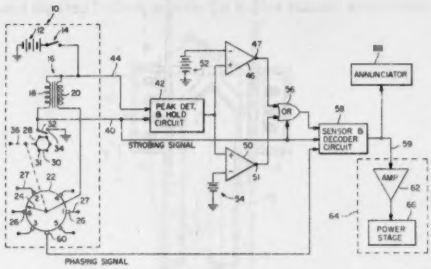
1. For use with an internal combustion engine equipped with an electronic fuel injection system including a plurality of injectors, apparatus for detecting misfiring of at least one of a plurality of fuel ignitors and for inhibiting operation of the electronic fuel injection system to certain of the plurality of injectors in response thereto, comprising:

means for providing a signal for each of a plurality of fuel ignition occurrences including the misfiring of the fuel ignitors;

means for providing a signal proportional to said fuel ignition occurrence signal;

means responsive to the fuel ignition occurrence signals and said proportional signal for detecting the level of the proportional signal for each of the plurality of fuel ignition occurrences and for providing a corresponding signal;

comparison means including means establishing a signal range for comparing the signal from the detecting means to said signal range and for providing comparison signals for providing an error signal when at least one of the fuel



ignition occurrence signals falls outside of the predetermined signal range to indicate a corresponding fuel ignitor misfire; and

means responsive to the error signal for providing an inhibit signal for inhibiting a fuel injector in the electronic fuel injection system corresponding to the certain of the misfiring fuel ignitor.

4,117,808

GAS INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Bonnosuke Takamiya, Johyoh, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1977, Ser. No. 802,559

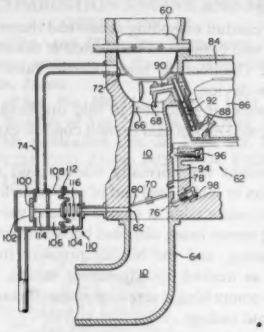
Claims priority, application Japan, Jul. 2, 1976, 51-79263; Feb. 23, 1977, 52-19540

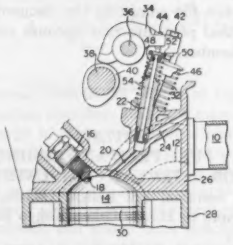
Int. Cl.[2] F02D *33/02*

U.S. Cl. 123—75 B **12 Claims**

1. A gas injection system for an internal combustion engine including a combustion chamber having an inlet port connected to a main intake passage in which a throttle valve is mounted, a spark plug having a spark gap facing into the combustion chamber, an injection bore provided near to said spark gap for injecting gas into said combustion chamber in a predetermined direction, and a secondary intake passage connected to the injection bore through a secondary inlet valve, said system comprising a first port provided in a wall of said main intake passage at a location in which said port is disposed slightly downstream of said throttle valve at an idling position thereof, but disposed upstream of the throttle valve when the latter is turned open, a flow of the gas supplied to said secondary intake passage being controlled by a negative pressure

produced at said first port so as to increase more the gas flow at a driving range in which said throttle valve is downstream of





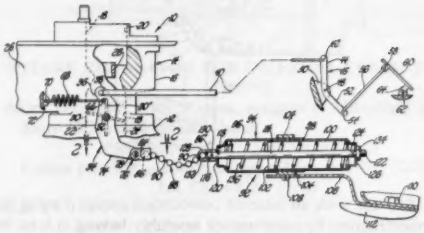
said first port than the gas flow at a driving range in which said throttle valve is upstream of said first port.

4,117,809

RESILIENT THROTTLE STOP MEANS

Milton J. Kittler, 6701 Kasba Cir., Scottsdale, Ariz. 85253

Division of Ser. No. 522,236, Nov. 8, 1974, Pat. No. 4,016,842.
This application Sep. 20, 1976, Ser. No. 724,557
Int. Cl.[2] F02D *11/02*; G05G *5/04*
U.S. Cl. 123—98 **4 Claims**



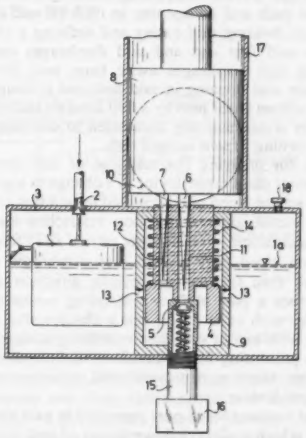
1. Resilient throttle stop apparatus for use in combination with an internal combustion engine having an intake structure with induction passage means formed therein and rotatable throttle valve means for controlling flow in said induction passage means, comprising first resilient means, second resilient means, and connecting means for operatively connecting said second resilient means to said throttle valve means of said induction passage means, said intake structure induction passage means being fixedly secured to and supported by said engine, said first resilient means being operatively connected to said throttle valve means as to apply thereto a first resilient force for urging said throttle valve means in a closing direction, said connecting means comprising functional lost-motion means effective to cause said second resilient means regardless of whether or not said engine is operating to exhibit an added resilient resistance force resisting further opening movement of said throttle valve means by associated throttle lever means after said throttle valve means has been opened to a preselected degree, said second resilient means said intake structure induction passage means said throttle valve means and said connecting means all being commonly supported by said engine, said second resilient means comprising coiled axially extending spring means, said connecting means operatively interconnecting said spring means and said throttle lever means, said lost-motion means permitting a predetermined degree of rotational movement of said throttle lever means in the throttle opening direction before said spring means exhibits said added resilient resistance force to further opening movement of said throttle valve means, said connecting means further comprising an axially movable rod-like member axially extending through said spring means, a movable spring seat connected to said rod-like member, said lost-motion means operatively interconnecting said throttle lever means to said rod-like member, and a relatively fixed second spring seat operatively engaging one end of said spring means, wherein said second spring seat is of a generally cup-shaped configuration with an end wall and a generally annular side wall joined to said end wall, said annular side wall defining an opening of a dimension sufficient to accept said spring means, and wherein said rod-like member extends through said end wall.

4,117,810

PROCESS FOR DEVICE FOR PREPARING IGNITABLE FUEL MIXTURES

Veit John, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 594,129, Jul. 28, 1975, Pat. No. 4,033,307.
This application Mar. 10, 1977, Ser. No. 776,362
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1974, 2433061; Oct. 30, 1974, 2451470
Int. Cl.[2] F07M *25/06*
U.S. Cl. 123—1 R **3 Claims**



1. A process for preparing an ignitable mixture of fuels having different calorific values for internal-combustion engines, which comprises the steps of admixing a fuel mixture including monohydric saturated aliphatic alcohols having from 1 to 4 carbon atoms in accordance with its calorific value with atmospheric oxygen over two adjustable dosing devices, feeding the ignitable mixture obtained to the internal combustion engine and adding hot exhaust gases from the internal combus-

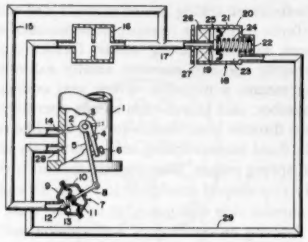
tion engine to the fuel mixture during said feeding step in an amount depending on the load on the engine.

4,117,811

THROTTLE VALVE POSITIONER

Toshiro Yoshida, Toyota, Japan, assignor to Toyota Jidosha Kogyo K.K., Japan

Filed Apr. 1, 1976, Ser. No. 672,635
Claims priority, application Japan, Aug. 26, 1975, 50-103346
Int. Cl.[2] F02D *11/08*
U.S. Cl. 123—103 R **2 Claims**



1. A throttle valve positioner in combination with an internal combustion engine having an air intake and a throttle valve provided in said air intake, said throttle valve positioner comprising:

a stopper provided adjacent said throttle valve for varying the position of said throttle valve and coupled to said throttle valve via a first adjustment means;

a means for normally operating said throttle valve;

a first vacuum bleed port provided in said air intake at a point downstream from said throttle valve when said engine is idling and upstream from said throttle valve when said engine is running at a steady speed;

a throttle valve positioner diaphragm device mechanically coupled to said stopper for moving said stopper in response to a vacuum at said first vacuum bleed port, said diaphragm device comprising a casing having first and second ends and an opening in each of said ends, a diaphragm dividing said casing and defining a chamber between said first end and said diaphragm and a spring biasing said diaphragm away from said first end and wherein said opening in said first end is coupled to said first vacuum bleed port by a first conduit and wherein said stopper is mechanically connected to said diaphragm via said opening in said second end;

a means for delaying the response of said throttle valve positioner diaphragm device to a change in vacuum at said first vacuum bleed port provided in said first conduit, said delay means comprising a flow restricting means having such a structure that the flow rate of fluid from said first vacuum bleed port toward said diaphragm chamber is greater than that in the reverse direction and further comprises a pair of flow restricting means arranged in parallel with each other, and a check valve disposed in series with one of said flow restricting means, said check valve permitting solely the flow of fluid from said first vacuum bleed port toward said chamber of said diaphragm device;

a second vacuum bleed port provided in said air intake at a point which is always downstream of said throttle valve; and

a vacuum control valve for fixing the vacuum of said first vacuum bleed port at atmospheric pressure whenever a vacuum at said second vacuum bleed port is greater than a predetermined value, said vacuum control valve comprising:

a casing having an open end communicating with the atmosphere;

a diaphragm provided within said casing with the outer periphery thereof brought into fluid-tight engagement with the inner wall of said casing and defining a chamber therein;

a branch conduit extending at one end thereof into said open end of said casing and connected at the other end thereof to said chamber of said throttle valve positioner diaphragm device;

a valve member mounted to said diaphragm for openably closing said end of said branch conduit extending into said casing;

biasing means for normally biasing said diaphragm in a direction in which said end of said branch conduit extending into said casing is closed by said valve member, said biasing means being disposed between said diaphragm and said casing, and the biasing pressure thereof being adjusted as desired by adjustment means, said adjustment means comprising a screw in screw threaded engagement with said casing;

a filler provided in the space formed between the rear end of said screw and said casing for inhibiting inflow of positive pressure into said vacuum control valve diaphragm chamber through the screw threads; and

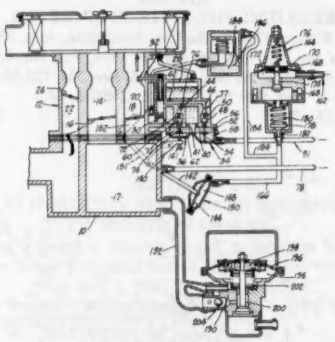
another conduit for admitting the vacuum at said second vacuum bleed port into said vacuum control valve diaphragm chamber.

4,117,812

AUXILIARY FUEL FEED AND TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Naohiko Sato, Saitama, and Keiichi Osawa, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1977, Ser. No. 757,689
Claims priority, application Japan, Jan. 17, 1976, 51/3774
Int. Cl.[2] F02P *5/14*; F02M *7/06*
U.S. Cl. 123—117 A **4 Claims**



1. For use with an internal combustion engine having fuel supplied thereto by a carburetor assembly having at least one intake passage and a throttle valve positioned within said passage, said carburetor assembly including a first fuel feed means to deliver fuel to said passage, a second fuel feed system comprising, in combination: a fuel valve of the diaphram type including a vacuum chamber formed on one side of a flexible diaphragm and a fuel chamber on the other side of said diaphragm, the passage connecting said fuel chamber to the intake passage, a speed detector, selector valve and check valve means whereby said vacuum chamber is connected to said engine intake passage downstream from said throttle valve at low speeds, connected to said passage through a check valve at medium speeds and vented to the atmosphere when high speeds are attained.

4,117,813

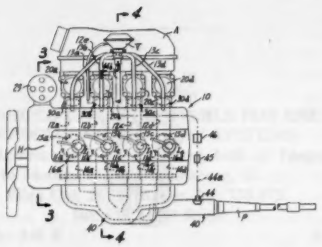
INTERNAL COMBUSTION ENGINE AND METHOD OF OPERATING IT

Ryuichi Yamashita, and Hiromitsu Matsumoto, Hamamatsu, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 496,142, Aug. 12, 1974, abandoned, which is a division of Ser. No. 496,141, Aug. 12, 1974, abandoned. This application Oct. 28, 1976, Ser. No. 736,461

Int. Cl.[2] **F02M** *7/00, 25/06;* **F02P** *5/04;* **F02M** *31/00*

U.S. Cl. 123—119 R **93 Claims**



1. In an internal combustion engine of the type which includes a combustion chamber, induction means for introducing an air/fuel charge to said combustion chamber, and exhaust means for exhausting a spent charge from said combustion chamber, the improvement comprising: means for constituting in said induction means said air/fuel charge which is leaner than stoichiometric with the possible exceptions of starting and warm-up operations, and leaner than stoichiometric, or stoichiometric, or nearly stoichiometric, at starting and warm-up operations; and means tending to maintain the numerical value of the residual fraction at low load conditions such that the engine operates on said air/fuel charge at said low load conditions without substantial misfiring, said residual fraction being defined as follows:

$$\text{Residual fraction} = \frac{\text{Amount of residual gases remaining in combustion chamber from previous cycle}}{\text{Amount of air (or air/fuel mixture) taken into combustion chamber for next cycle} + \text{Amount of residual gases remaining in combustion chamber from previous cycle}}$$

4,117,814

INTAKE REGULATOR FOR INTERNAL COMBUSTION ENGINE

Akira Takahashi, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

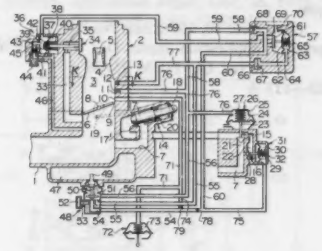
Filed Jun. 21, 1977, Ser. No. 808,623

Claims priority, application Japan, Mar. 4, 1977, 52-24024

Int. Cl.[2] **F02M** *25/06*

U.S. Cl. 123—119 A **7 Claims**

1. An intake regulator for an internal combustion engine comprising means defining an exhaust-gas recirculation passage connecting an exhaust passage with an intake passage to recycle part of the exhaust-gas back to the intake passage, a recirculated exhaust-gas control valve in said exhaust-gas recirculation passage for controlling the quantity of the recirculated exhaust-gas, differential-pressure responsive means actuating said recirculated exhaust-gas control valve by a vacuum established in a vacuum chamber thereof leading to the intake passage, an air passage for diluting air-fuel mixtures by supplying air into the intake passage or the fuel passage in the carburetor, an air control valve in said air passage for controlling the quantity of air supply, differential-pressure responsive means actuating said air control valve by a vacuum established in a vacuum chamber thereof leading to the intake passage, means defining open-to-atmosphere passages leading from each of said two vacuum chambers, and valve control means closing either of said recirculated exhaust-gas control



valve and said air control valve when the other is open by opening and closing said open-to-atmosphere passages.

4,117,815

CLOSED-LOOP MIXTURE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE USING ERROR-CORRECTED EXHAUST COMPOSITION SENSORS

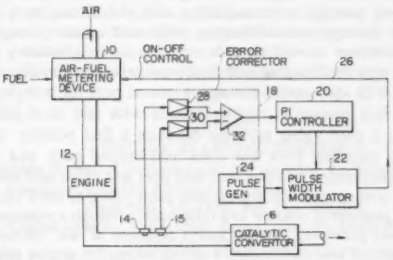
Kenji Ikeura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 13, 1976, Ser. No. 676,480

Claims priority, application Japan, Apr. 22, 1975, 50-48200; Apr. 30, 1975, 50-51562; Jun. 24, 1975, 50-88311[U]

Int. Cl.[2] **F02M** *7/00*

U.S. Cl. 123—119 EC **14 Claims**

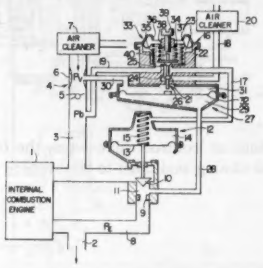


1. A mixture control system for an internal combustion engine, comprising first and second means for detecting an exhaust composition of the engine to generate signals of different amplitude and slope characteristics as a function of the air-fuel ratio of the mixture detected thereby, said detecting means comprising exhaust composition sensors at substantially the same location in the exhaust system of the engine, said sensors having a tendency to generate signals having errors in the detected composition arising from changes in the performance characteristics of the detecting means, and means responsive to and for combining the signals derived from the first and second composition detecting means to generate a signal substantially free from the errors arising from the changes in performance characteristics of the first and second composition detecting means.

4,117,816
EXHAUST GAS RECIRCULATING SYSTEM FOR USE IN INTERNAL COMBUSTION ENGINE

Mikio Minoura, Nagoya, Japan, assignor to Aisan Industry Co., Ltd., Japan

Filed Dec. 10, 1976, Ser. No. 749,325
Claims priority, application Japan, Dec. 23, 1975, 50-154503
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A 5 Claims



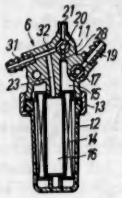
1. An exhaust gas recirculating system for use in an internal combustion engine, comprising:
- an exhaust gas return passage interconnecting the exhaust passage and the intake passage to said internal combustion engine;
- a carburetor communicating with said intake passage, said carburetor having a throttle valve and a venturi portion;
- a fixed orifice provided in said exhaust gas return passage;
- a regulating valve provided in said exhaust gas return passage downstream of said fixed orifice and controlling the pressure in a pressure chamber defined between said regulating valve and said fixed orifice;
- a regulating valve drive means having a pressure-variable space for actuating said regulating valve in response to the pressure in said space; and
- a control means for controlling the pressure in said pressure-variable space, said control means including: a first passage communicating with said pressure-variable space; a second passage communicating with the atmosphere; a third passage communicating with said intake passage downstream of said throttle valve in said carburetor; a first port for bringing said first passage into communication with said second passage; a second port for bringing said first passage in communication with said third passage; a pilot valve movable between a first position to close said first port and open said second port, and a second position to open said first port and close said second port; means for urging said pilot valve toward said first position in resonse to a difference between a pressure in said pressure chamber and a pressure in said venturi portion of said carburetor; a spring means for urging said pilot valve toward said second position at all times; and means for increasing a force of said spring means, depending on a reduction in pressure in said intake passage downstream of said throttle valve when the pressure in said intake passage becomes lower than a given pressure level.

4,117,817
SYSTEM FOR DRAINING AIR FROM AN ENGINE FUEL FILTER

Tsuyeshi Nishida, Sakaishi, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Apr. 8, 1977, Ser. No. 785,830
Claims priority, application Japan, Jan. 24, 1977, 52-7141
Int. Cl.[2] F02M *59/44;* B65D *25/54*
U.S. Cl. 123—136 8 Claims

1. A system for draining air and entrained vapor contained within a fuel strainer and connected fuel paths of an engine, said system including:
- an engine;
- a fuel reservoir located on the engine at a relatively high position;
- fuel pump means located on the engine at a relatively low position;
- a fuel strainer located on the engine between said fuel reservoir and said fuel pump means, said strainer including a fuel cock and a drain cock in the upper portion thereof, and having an unfiltered-fuel chamber and a filtered fuel chamber;

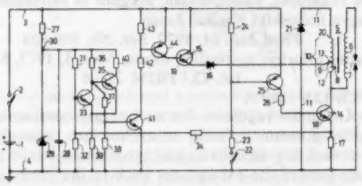


- a fuel supply pipe connecting said fuel cock with the bottom of said fuel reservoir;
- an escape line connecting said drain cock with said fuel reservoir; and
- a downwardly inclined conduit leading from said strainer to said fuel pump means;
- said drain cock being constructed and arranged to be switchable to any one of three positions, including a first position wherein said unfiltered-fuel chamber is connected with said escape line, a second position wherein said filtered-fuel chamber is connected with said escape line, and a third position wherein neither of said chambers is connected with said escape line.

4,117,818
IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES WITH TAPE[D] IGNITION COIL

Bernd Bodig, Leinfelden; Helm[ut] [illegible], Schwaikheim, and Gerd Hohne, Ludwigsburg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jul. 9, 1976, Ser. No. 704,116
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1975, 2531337
Int. Cl.[2] F02[illegible]
U.S. Cl. 123—148 E 18 Claims



1. Ignition system for an internal combustion engine to generate an ignition event having means (3,4) forming a current supply; and comprising
- an ignition coil (5) with a tapped primary (8) which forms a first primary partial portion (9) and a second primary portion (10), the second primary portion having an inductance which is high with respect to the inductance of said first primary partial portion (9);
- a supply circuit connected to said current supply, including a controlled switch (14), connected in circuit with said

first primary portion (9) only to energize only said first portion when the controlled switch (14) is closed;

control means connected to and controlling said supply circuit during succesive time intervals as a function of electromagnetic energy stored in the coil to become conductive and control current flow from said current supply through said first partial primary portion to store electromagnetic energy in the coil (5);

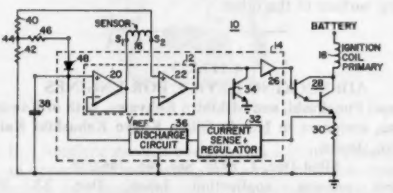
and a shunt circuit (11) connected to said second primary portion (10) and carrying the inductive current in the primary winding arising after the end of and during the periods between the respective time intervals.

4,117,819

THRESHOLD CIRCUIT SUITABLE FOR USE IN ELECTRONIC IGNITION SYSTEMS

Robert B. Jarrett, and Don W. Zobel, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 26, 1976, Ser. No. 735,472
Int. Cl.[2] F02P *9/00*
U.S. Cl. 123—148 E **8 Claims**



1. In a variable dwell ignition system suitable for controlling the operation of an engine by receiving timing signals generated across a sensor coil in timed relationship to the operation of the engine to cause the duration of current flow through an ignition coil to be varied as engine speed is varied, the ignition system including a monolithic integrated threshold circuit coupled across the sensor coil which is responsive to the timing signals for producing a control signal that is utilized to vary the dwell time of the system, the improvement comprising:

the threshold circuit including

(a) an input amplifier circuit comprising a Darlington amplifier and an unity gain amplifier, said Darlington amplifier having a high impedance input to which a variable direct current potential representative of the magnitude of the generated timing signals is applied thereto and an output, said unity gain amplifier having an input coupled to said output of said Darlington amplifier and a low impedance output which is coupled to a first terminal of the sensor coil such that the magnitude of the potential appearing at the first terminal of the sensor coil varies in accordance with said direct current potential being varied, the operating characteristics of said unity gain amplifier being a function of both fabrication process variations and variations in operating temperatures; and

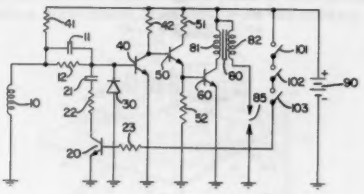
(b) a comparator circuit having an input coupled to a second terminal of the sensor coil for producing the control signal at an output thereof when the magnitude of the potential appearing at said input becomes greater then the magnitude of a predetermined reference potential, said comparator circuit having operating characteristics substantially identical with said unity gain amplifier such that the dwell time does not vary due to process and temperature variations.

4,117,820

IGNITION CIRCUIT

Seiichi Kashiwazaki, and Taiji Hasegawa, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 27, 1976, Ser. No. 754,277
Claims priority, application Japan, Dec. 26, 1975, 50-154986
Int. Cl.[2] F02P *1/08;* **H05B** *41/00*
U.S. Cl. 123—148 E **6 Claims**



1. An ignition circuit for use in an internal combustion engine comprising:

a transformer for producing a high voltage signal for spark plugs in response to an abrupt interruption of primary current flowing therethrough;

a current source connected to said transformer in series;

first means having an on and an off condition and forming a series circuit with said transformer and said current source, said first means permitting a current to flow in said series circuit when in said on condition;

second means for generating an alternating voltage signal synchronous with rotation of the engine and with a peak voltage proportional to this speed of rotation;

third means for controlling the on and off condition of said first means in response to the alternating voltage signal from said second means;

delay means including resistance means and capacitance means for alternately charging to positive and negative voltages in accordance with the alternating voltage signal from said second means when said delay means is actuated to thereby delay the on and off condition operation of said first means, the capacitance value of said capacitance means and the resistance value of said resistance means being chosen such that the on and off condition operation of said first means is delayed by a constant angle with respect to the rotating angle of the engine; and

switching means for actuating said delay means in accordance with the operating condition of the engine.

4,117,821

ENGINE STARTING SYSTEM

Michio Kawai, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 19, 1976, Ser. No. 743,098
Claims priority, application Japan, Nov. 20, 1975, 50-139514
Int. Cl.[2] F02N *17/00*
U.S. Cl. 123—179 L **9 Claims**

1. A starting system for an engine, comprising:

a starter motor for starting said engine;

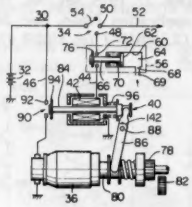
first means for temporarily effecting an increase in the amount of fuel fed to a combustion chamber of said engine to a value for starting said engine;

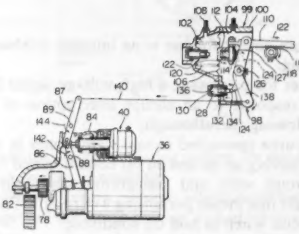
a common actuator, including an electrically-activated solenoid, operatively connected to said starter motor and to said first means, and having a starting position into which said common actuator is movable and in which said common actuator connects said starter motor to said engine and concurrently operates said first means;

second means for moving said common actuator into said starting position, said second means including an electric power source and a starter key switch electrically connected to said electric power source and to said solenoid

to energize said solenoid when said starter key switch is closed;

third means for actuating said starter motor; and





an operating rod operatively connected to said starter motor and to said first means and located with respect to said solenoid to be moved into said starting position in response to energization of said solenoid.

4,117,822

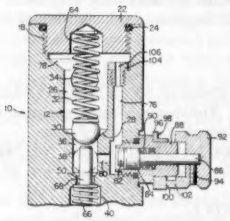
ENGINE PROTECTIVE DEVICE WITH RESTRICTED MANUAL OVERRIDE

J. T. Mills, Houston, Tex., assignor to Sentinel Distributors, Inc., Denver, Colo.

Filed Apr. 22, 1977, Ser. No. 789,884

Int. Cl.[2] F02B *77/08*

U.S. Cl. 123—198 DB **2 Claims**



1. In apparatus for controlling the flow of fuel to an internal combustion engine in response to pressure conditions existing in a pressure-lubricating system of the type comprising a body having a main fuel passageway therein, fuel inlet and outlet ports communicating with said passageway adapted to be connected to the fuel supply line of the engine, a valve in said passageway controlling the normal flow of fuel between said inlet and outlet ports, pressure-actuated means normally subject to a pressure equal to that of the lubricant in said lubricating system for maintaining said valve in open position as long as the pressure exerted on said means is at least equal to a predetermined value, and means operable to close said valve when the pressure exerted on said pressure-actuated means drops below said predetermined value, the improvement which comprises; manually operable means for supplying to said engine after said valve has closed automatically due to a drop in lubricant pressure a restricted amount of fuel sufficient only to run the engine at reduced power and reduced speed, said means comprising a bypass fuel passageway in said main body, bypassing the portion of said main passageway controlled by said valve, means for passing a predetermined restricted amount of fuel through said bypass passageway, an override body threaded into said main body adjacent a portion of said bypass passageway, a plunger including a sealing member slidably mounted in said override body, a spring in said override body normally urging said plunger and sealing member inwardly with respect to said main body so as to close said bypass passageway, a manually operable control cap fixed to said plunger for pulling said plunger and sealing member outwardly against the pressure of said spring and for rotating the plunger, an override stop member fixed to said override body having two stop surfaces of different heights circumferentially spaced from one another, and a projection on said control cap normally resting on the lower of said stop surfaces so that said spring urges said plunger and sealing member inwardly to close said bypass passageway, but adapted to rest on the higher of said stop surfaces and thereby open said bypass passageway when said plunger and sealing member are manually pulled outwardly and then rotated so as to move said projection from one stop surface to the other.

4,117,823

AIR SUCKING DEVICE FOR ENGINES

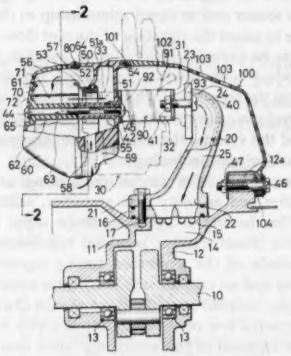
Katsunori Funabashi, and Mikihiro Kohyama, both of Kawagoe, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1976, Ser. No. 746,238

Claims priority, application Japan, Dec. 13, 1975, 50/168602[U]

Int. Cl.[2] F02B *77/00*

U.S. Cl. 123—198 E **8 Claims**



1. An air sucking device for engines, comprising, in combination:

an engine with a crankcase;

a suction pipe connected to and projecting from said crankcase of said engine;

a carburetor connected to a front end portion of said suction pipe;

an air cleaner case, in which an air cleaner is fitted, connected to a front end portion of said carburetor;

a cleaner cover removably connected to a front end of said air cleaner case;

a covering member, covering at least the upper surfaces of said carburetor and suction pipe, connected at one end thereof with said air cleaner case and at the other end

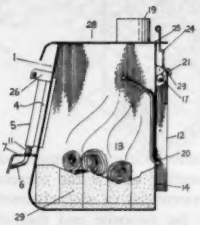
thereof with the crankcase side to cover air cleaner case, carburetor, and suction pipe;
a groove made in the rear surface of said air cleaner case;
said covering member being engaged at its front end with said groove;
a fitting member (**12***a*) being provided projecting from said crankcase; and
said convering member (**100**) being connected in its lower end portion bent and suspended along said suction pipe to said fitting member (**12***a*) projected on said crankcase.

4,117,824

AUTOMATIC WOOD BURNING HEATING STOVE

Kendrick H. McIntire, Rte. 2, Box 1000, and John E. McIntire, Rte. 2, Box 151-A, both of Aurora, Oreg. 97002

Filed Nov. 17, 1976, Ser. No. 742,558
Int. Cl.[2] **F24B** *11/00*
U.S. Cl. 126—15 R **11 Claims**



1. In a fireplace stove, a body having a front fireplace opening, an upper exhaust opening and a rear intake air opening,
fireplace door means movable from a closed position sealing said front fireplace opening to an open position opening said front fireplace opening,
closure means for closing said rear intake air opening while said door means is open and for opening said rear intake air opening when said door means is closed, and
an air preheating passage extending downwardly along the back wall of said body to said rear intake air opening, said passage being open at its top,
said back wall of said stove being of metal and forming one wall of said passage,
the portion of said back wall forming said one wall of said passage being uninsulated substantially from the top of said passage to said rear intake air opening, whereby a fire in said stove can heat air entering said air preheating passage,
said door means comprising reflective means for directing heat toward said portion of said back wall that forms said one wall of said passage.

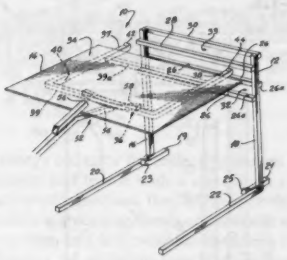
4,117,825

COOKING STAND

Thomas Alexander Robertson, Sheldrake Lake, R.R. No. 3, Armdale, Halifax County, Nova Scotia, Canada

Filed May 26, 1976, Ser. No. 690,194
Claims priority, application Canada, Jun. 12, 1975, 230081
Int. Cl.[2] **A47J** *33/00;* **F24B** *1/26, 3/00*
U.S. Cl. 126—29 **2 Claims**

1. A cooking stand comprising an upstanding supporting frame comprising a pair of vertically disposed spaced apart legs each having a forwardly extending foot at its lower end, and including at least one pair of horizontally disposed, spaced apart retaining bars, remote from said lower end, said pair including an upper bar having a lower downwardly facing wall and a lower bar having an upper upwardly facing wall defining a horizontal slot therebetween; one of said pair of retaining bars extending outwardly, forwardly of said legs, and the other of said pair extending outwardly, rearwardly of said legs; and a support member comprising a plate having a flat upper cooking surface and including at least a pair of spaced apart retaining arms disposed adjacent opposite side edges of said plate and having upper and lower surfaces, extending from an underside of said plate, said arms being removably supported in said slot with bearing contact between said lower wall of said upper bar and said upper surfaces and between said upper wall of said lower bar and said lower surfaces, whereby said support member is held in said frame to dispose said cooking surface horizontally, such that in use the cooking surface



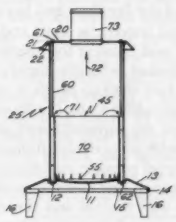
can be located vertically above a source of heat for cooking; each said foot being hingedly mounted on its leg by a hinge element mounted on said let whereby said foot can be pivoted to a compact carrying position adjacent said leg, said hinge element having lcoking means for locking said foot in a forwardly extending position during use and having a vertically downwardly extending slot defined therein adapted to receive and hold an outer edge of said plate when said foot is in said compact carrying position.

4,117,826

WOOD BURNING STOVE

Joseph A. Bette, R.F.D. #4, Southbury, Conn. 06488

Filed Mar. 7, 1977, Ser. No. 775,254
Int. Cl.[2] **F23M** *5/00*
U.S. Cl. 126—65 **3 Claims**



1. A stove comprising
a generally horizontal imperforate bottom wall,
a generally horizontal top wall,
a generally vertical outer casing extending between said bottom and top wall,
a liner within said casing extending completely about the same and spaced therefrom to provide a draft conduit through the space, said liner resting on said bottom wall and of a vertical extent less than said casing to be spaced from the top wall, said liner providing with said bottom wall a fire box, Serial No. **775,254**
said bottom wall having an upwardly opening recess with opposite upstanding spaced walls, said casing and liner being located in said recess between said upstanding walls,
said liner being provided with draft openings adjacent its lower edge for the entrance of air therethrough,
means to provide the entrance of air through said casing to

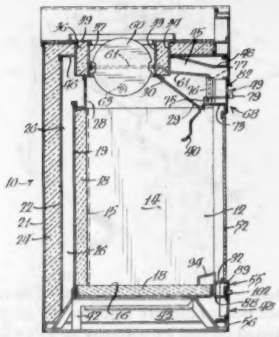
the conduit formed by said liner whereby air is conveyed to said draft openings and to said fire box,
and means to direct the heated gases from the casing.

4,117,827

FIREPLACE CONSTRUCTION

Thomas F. Billmeyer, Wisconsin Rapids, Wis., assignor to Preway Inc., Wisconsin Rapids, Wis.

Filed Mar. 14, 1977, Ser. No. 777,063
Int. Cl.[2] F24B 7/04
U.S. Cl. 126—121 **12 Claims**



1. In a prebuilt fireplace construction adapted to be installed in a structure, the combination comprising:
- a firebox having an open forward side and an outlet for combustion gases;
- a housing at least partially surrounding said firebox in close proximity thereto, said outlet extending through the top of said housing;
- a damper disposed within said outlet mounted for rotation between open and closed positions;
- a shaft rotatably supported within the fireplace to support said damper, said shaft extending through said housing and having one end remote from said damper transverse to the rotational axis of said shaft positioned adjacent a forward wall of said housing;
- means movably supported for external actuation of said shaft from the front of the fireplace and having a finger portion for engaging said transverse shaft end and a handle portion external of said housing for operator manipulation of said actuation means whereby movement of said finger portion rotates said shaft to position said damper;
- an inlet conduit extending along the forward portion of said housing between the foreward wall of said housing and the forward bottom edge of said firebox, said inlet conduit defining an internal passage communicating externally of said housing through first passage means in the lower part of the forward wall thereof and through second passage means in the upper wall thereof with said firebox, combustion air thereby being drawn in through said first passage means and delivered through said second passage means upwardly into said firebox; and
- closure means adjacent said first passageway slidably disposed within said conduit for opening and closing said first passage means thereby controlling the amount of air drawn into said firebox.

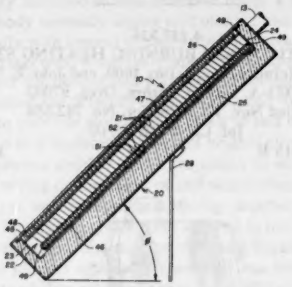
4,117,828

SOLAR COLLECTOR

Jerry A. Brownfield, 107 W. Rustic Lodge Ave., Minneapolis, Minn. 55409

Filed Dec. 4, 1975, Ser. No. 637,696
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 **11 Claims**

1. A solar collector for heating a gaseous fluid comprising a housing, a plurality of substantially parallel radiation absorbing, substantially non-reflective, vanes mounted in said housing with the spacing between said vanes being between one-half and one-sixth of the depth thereof, said vanes each having fixedly associated with the inner portion thereof an inner radiation absorbing, substantially nonreflective surface, said housing having a closed inner wall and a radiation transparent outer wall mounted closely adjacent and generally parallel to the outer portions of said vanes so as to define with said vanes and said inner radiation absorbing surface a plurality of relatively narrow, contiguous unobstructed channels, each open to direct



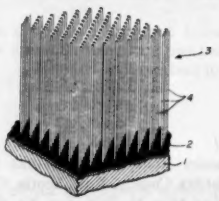
radiation at said outer portions of said vanes, said housing having an inlet manifold at one end thereof communicating with one set of extremities of said channels and having an outlet manifold at the opposite end thereof communicating with the opposite set of extremities of said channels, and means for circulating a gaseous heat exchange fluid through said inlet manifold, said channels and said outlet manifold to heat utilizing apparatus, said spacing between said vanes being between one-eighth and one-fourth of an inch and the velocity of said fluid being sufficiently small that the flow of said gaseous fluid through said vanes is laminar.

4,117,829

FUR-LIKE PHOTOTHERMAL CONVERTER SURFACE

Daniel Gross, Carouge, Geneva, and Pierre Genequand, Geneva, both of Switzerland, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Jan. 6, 1977, Ser. No. 757,202
Claims priority, application Switzerland, Jan. 8, 1976, 156/76
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 **26 Claims**



1. Photothermal converter apparatus for converting incident photon energy into heat, comprising a heat-absorbing surface and a multiplicity of substantially parallel fibres secured to said surface and extending substantially rectilinearly therefrom and having a length of at least about 1 cm, said fibers being arranged substantially equidistant from each other and being comprised of a material which is transparent to the incident photon energy and at least partially opaque to infrared thermal radiation re-emitted by said surface, whereby said fibres act as a light guiding structure with respect to the incident photon energy and serve to suppress energy losses from the converter by inhibiting infrared thermal reradiation from said surface and by inhibiting convection losses.

4,117,830

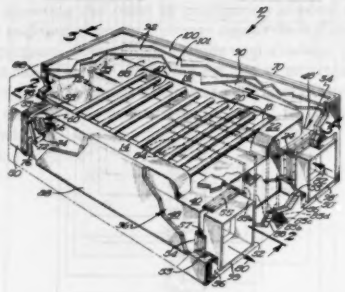
GANGABLE RADIANT ENERGY COLLECTOR

Jag M. Bansal, and Anil Kumar, both of 1301 Highway No. 7, Hopkins, Minn. 55343

Continuation-in-part of Ser. No. 746,547, Dec. 1, 1976. This application Mar. 1, 1977, Ser. No. 773,297

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 15 Claims



1. In combination with a radiant energy collector having an inlet and outlet through which a circulatable heat transfer medium may flow, a ganging apparatus for ganging said energy collector with leading and trailing energy collectors ganging apparatus comprising:

an insulative housing surrounding said energy collector, defining a plenum chamber within said housing, and including window means through which radiant energy may be incident on said energy collector;

a supply duct capable of passing heat transfer medium therealong, said supply duct being within said housing and extending through said housing with an entrance and exit outside said housing, said supply duct being connected in fluid flow communication with said inlet of said collector, and said supply duct entrance and exit being connectable in fluid flow communication with ganging apparatuses on the leading and trailing energy collectors, respectively;

a return duct capable of passing heat transfer medium therealong, said return duct being within said housing and extending through said housing with an entrance and exit outside said housing, said return duct being connected in fluid flow communication with said outlet of said energy collector, and said exit and entrance of said return duct being connctable in fluid flow communication with ganging apparatuses on the leading and trailing energy collectors, respectively, permitting the circulatable heat transfer medium to flow along said supply and return ducts to and from the ganging apparatuses of leading and trailing energy collectors and throgh said energy collector;

each said duct including a central segment and a pair of terminal segments at opposite ends of said central segment, said terminal segments being thermally insulated from said central segment to substantially reduce conductive heat loss from said central segment to said terminal segments, said terminal segments being connected in fluid flow communication with said central segment; and

said central segment being wholly within said housing and said terminal segments extending through said housing to define said entrance and said exit.

4,117,831

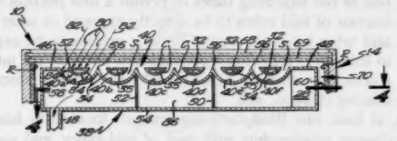
ENERGY COLLECTOR FOR COLLECTING SOLAR ENERGY AND THE LIKE

Jag M. Bansal, and Anil Kumar, both of Hopkins, Minn., assignors to Manju Bansal, Hopkins, Minn.

Filed Dec. 1, 1976, Ser. No. 746,547

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 13 Claims



1. An energy collector for collecting radiant energy from an energy source and usable with a circulation system having a fluid heat-transfer medium, the collector comprising:

first radiation-absorbing means connectable with the circulation system, said first radiation-absorbing means including a plurality of radiation-absorbing, hollow-interior conduits confronting the energy source and separated from each other by slots, each said conduit capable of channeling the heat-transfer medium therethrough, said conduits capable of absorbing radiation energy from the energy source and conducting such energy to heat-transfer medium within said hollow interior;

second radiation-absorbing means connected to said first radiation-absorbing means to permit flow of heat-transfer medium therebetween and connectable to the circulation system to permit heat-transfer medium flow within said second absorbing means and between said second absorbing means and the circulation system, said second absorbing means having a face which extends below said conduits and confronts said conduits from below, confronts said slots and also confronts the energy source through said slots, said face extending uninterruptedly adjacent said slots and conduits to receive and absorb most radiant energy passing through said slots and incident on said face so as to conduct the energy to the heat-transfer medium, and also to define a reflector for reflecting radiant energy which is not absorbed by said second means toward said first absorbing means, thereby increasing radiation intensity and absorption by said first absorbing means; and

an insulative housing adjacent said first and second radiation absorbing means and defining a plenum about said first and second absorbing means to contain plenum fluid in said plenum and to decrease energy loss from said first and second absorbing means, said housing including window means through which radiation energy may be incident on said first and second radiation-absorbing means.

4,117,832

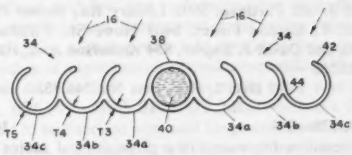
SOLAR ENERGY COLLECTOR

Raymond R. Lupkas, 54 Mt. Pleasant Dr., Trumbull, Conn. 06611

Filed Nov. 7, 1977, Ser. No. 849,237

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 3 Claims



1. A collector for capturing solar rays and transferring the

heat energy therein to a circulating fluid for utilization comprising:

A. a plurality of longitudinally extending adjoining tubes in heat exchange relationship with one another, each of said tubes having a longitudinally extending opening therein which subscribes an arc of approximately 90° and said openings are oriented in the first quadrant for half of the adjoining tubes and in the second quadrant for the other half of the adjoining tubes to permit a first portion of the interior of said tubes to be directly exposed to solar rays, said tubes having a second interior portion to be exposed to solar rays reflected from said first portion, the interior and exterior surfaces of said tubes having a heat absorbing coating thereon, and

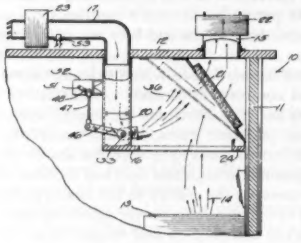
B. at least one fluid carrying conduit located in heat exchange relationship with two of said tubes, and each of said plurality of tubes having a cross sectional wall thickness dimension in inverse proportion to its distance from said conduit whereby the tubes in heat exchange relationship with said conduit have a greater wall thickness than the next adjacent tubes and the tubes most remote from said conduit have the thinnest wall thickness.

4,117,833

EXHAUST HOOD WITH ADJUSTABLE AIR INJECTION NOZZLE

Robert H. Mueller, Rte. 2, Box 34, Sheboygan Falls, Wis. 53085

Filed Feb. 16, 1977, Ser. No. 769,372
Int. Cl.[2] F21C *15/08;* **F23J** *11/00*
U.S. Cl. 126—299 D **12 Claims**



1. In an exhaust hood having an input air plenum, an air exhaust duct and a filter therebetween, the improvement for adjusting the path of air introduced through said input air plenum into said hood with respect to the position of the filter, said improvement comprising said input plenum having a nozzle spout opening, a nozzle spout in said opening and a bearing on which said nozzle spout is turnable in said opening to inject air from said plenum into said hood at the desired angle of incidence to said filter, said nozzle spout having a lip and a hinge on which the lip is adjustably connected to the spout to function as a deflector to further control the path of flow of air injected into the exhaust hood by the spout.

4,117,834

PHYSIOLOGICAL MOTOR ACTIVITY MONITORING APPARATUS

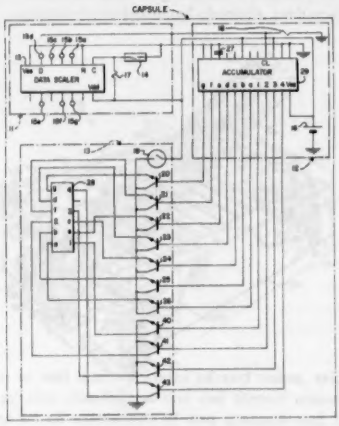
Richard J. Mc Partland, 5995 Library Rd., Bethel Park, Pa. 15102; F. Gordon Foster, 6409 Howe St., Pittsburgh, Pa. 15206, and David J. Kupfer, 834 Amberson Ave., Pittsburgh, Pa. 15232

Filed Dec. 2, 1976, Ser. No. 746,852
Int. Cl.[2] A61B *5/10*
U.S. Cl. 128—2 S **10 Claims**

1. Apparatus for monitoring physiological motor activity comprising a miniaturized capsule adapted to be affixed to and worn by the person being monitored, said capsule containing:

(a) a motion sensing means sensitive to linear and rotational movements of said capsule,

(b) electronic scaling means in circuit with said motion sensing means for providing an output of pulses corresponding in number to units of motor activity, each unit of which comprises a predetermined plurality of said movements, as registered by said motion sensing means,



(c) an integrated electronic accumulator connected to said scaling means for accumulating said output of pulses from said scaling means, and

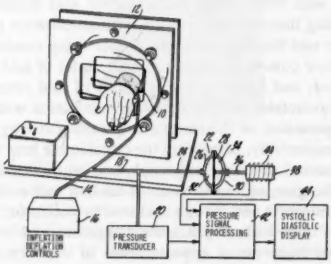
(d) an electronic-sensory means for registering and signalling the output of pulses in said accumulator relating to the number of units of motor activity.

4,117,835

METHOD AND APPARATUS FOR BLOOD PRESSURE MEASUREMENTS

William J. Williams, Ann Arbor, Mich., assignor to Weisman & Allen, Madison Heights, Mich.

Filed Dec. 8, 1976, Ser. No. 748,528
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 M **21 Claims**



1. A method of determining the systolic and diastolic blood pressure of a subject, including the steps of: applying a deform-

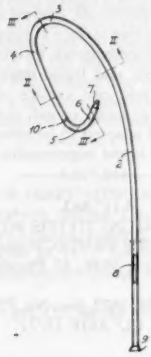
able fluid pressure enclosure to an extremity of the subject; varying the pressure in said deformable fluid pressure enclosure between a maximum pressure value corresponding to that required to completely occlude the blood pressure vessels of the subject in the extremity to which the fluid pressure enclosure is applied and a minimum pressure value less than that at which significant occlusion of the blood vessels occurs; monitoring the pressure existing in said deformable fluid pressure enclosure over the cycle between said maximum pressure and said minimum pressure and generating signals corresponding thereto; storing said signals in a signal memory; monitoring the rate of change of pressure in said deformable fluid pressure enclosure over said cycle and generating signals corresponding thereto; detecting the onset of precipitous increase and decrease in said rate of pressure change signals during said variation in pressure; determining systolic and diastolic pressure from said detecting step, including the step of ascertaining the respective pressure signals existing at said onset of precipitous increase and decrease respectively of rate of pressure change signals; whereby said systolic and diastolic pressure may be obtained.

4,117,836

CATHETER FOR SELECTIVE CORONARY ARTERIOGRAPHY OF THE LEFT CORONARY ARTERY

Uno Eugen Erikson, Uppsala, Sweden, assignor to Siemens-Elema AB, Solna, Sweden

Filed Jun. 23, 1976, Ser. No. 698,997
Claims priority, application Sweden, Jun. 23, 1975, 7507201
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—2.05 R **4 Claims**



1. A catheter for selective coronary arteriography of the left coronary artery, which catheter comprises an elongated, tubular member having an interior channel therein extending the length of said catheter, said catheter having a main part and an end section which latter comprises by turn from the main part a slightly curved part, a first short strongly curved part, a straight part, a second short strongly curved part and a short end part which is shaped to end in a taper, which catheter is characterized by being provided with a single perforation just means opening into the tubular channel in said straight part at the end thereof before the beginning of the second strongly curved part and on the side of the catheter which is facing the onlooker when the catheter is placed with the curvatures clockwise from the main part.

4,117,837

MONOPIECE FACE MASK FOR BEAUTY TREATMENT

Jose Maria Masso Remiro, Barcelona, Spain, assignor to Turbo, S.A., Barcelona, Spain

Filed May 9, 1977, Ser. No. 795,184
Claims priority, application Spain, May 26, 1976, 221.224[U]
Int. Cl.[2] A61F *5/08*
U.S. Cl. 128—76 B **1 Claim**

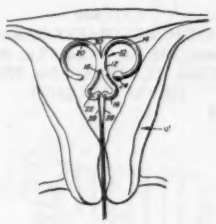
1. Monopiece face mask for beauty treatment, essentially characterized in that it comprises a sheet, stretchable in all directions and impermeable, which is shaped according to the head of a human being and which covers said head up to the neck with the exception of the cranial cavity, said sheet being provided with two openings for the ears and having superficially a series of markings defining zones which can be cut out so that the elastic action of the mask is directed to specific regions of the skin.

4,117,838

INTRAUTERINE CONTRACEPTIVE DEVICE

Harrith M. Hasson, 345 Fullerton Pkway., Chicago, Ill. 60614

Continuation-in-part of Ser. No. 719,959, Sep. 2, 1976, abandoned. This application Mar. 14, 1977, Ser. No. 777,076
Int. Cl.[2] A61F *5/46*
U.S. Cl. 128—130 **17 Claims**



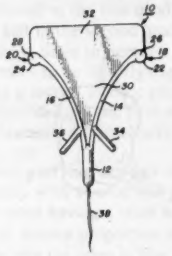
1. An intrauterine contraceptive device which comprises: a member adapted for insertion in the uterus formed of flexible material and having a central portion; a first upper arm extending outwardly and around from said central portion and back toward said central portion to form a first loop; a second arm extending downwardly from said central portion, then outwardly and inwardly to form a retaining member; and a third upper arm extending outwardly and around from said central portion and back toward said central portion in a direction opposite from said first arm to form another loop, the distal ends of said first and third upper arms being substantially non-overlapping with respect to said central portion to prevent the formation of a spiral under normal compression which may cause said distal ends to extend out of the main plane of the member, said second arm defining a hinge portion; a filament connected to said second arm, said hinge and filament cooperating to permit said second arm to be straightened easily when the filament is pulled downwardly.

4,117,839

INTRAUTERINE DEVICE

John McLean Morris, Cedar Rd., Woodbridge, Conn. 06525

Division of Ser. No. 549,584, Feb. 13, 1975, Pat. No. 4,038,978.
This application May 16, 1977, Ser. No. 797,369
Int. Cl.[2] A61F 5/46
U.S. Cl. 128—130 5 Claims



1. An intrauterine device comprising a resilient Y- or V-shaped member, said resilient member having two arms gradually and continuously diverging upwardly and outwardly from the intersection thereof adjacent the base portion of said resilient member; said arms being sufficiently resilient so said arms can be urged together during positioning of said intrauterine device in an inserter for inserting said intrauterine device into a uterus; a unitary flexible membrane extending between said arms, said membrane covering the entire area between said arms and extending above an imaginary line passing through the end of said arms a dimension sufficient to contact the fundus of a uterus, the extending portion of said membrane terminating in a substantially linear edge and covering a substantially rectangular area defined by said end portions and said substantially linear edge and a flexible string attached to said intersection, said string being adapted to extend outwardly through the cervix when said intrauterine device is in position within the uterus.

4,117,840

PEDIATRIC RESTRAINT GARMENT

Rebecca Ann Rasure, Rte. No. 5 Cedar La., Rome, Ga. 30161

Filed Mar. 22, 1977, Ser. No. 779,982
Int. Cl.[2] A61F 13/00
U.S. Cl. 128—134 8 Claims

1. A restraint garment for at least partially inhibiting the movements of a person on a supporting structure, comprising:

a flexible panel member having anterior and posterior portions, the panel member having an opening formed centrally therein between said anterior and posterior portions, the opening receiving the head and neck of a user, the anterior and posterior portions of the panel member respectively fitting over and generally loosely conforming to the frontal surfaces and rear surfaces of the upper torso of said user;

flap-like wing members extending laterally from each side of the posterior portion of the panel member;

contact fastening means disposed on inner surfaces of the wing members and on outer surfaces of the lower portions of the anterior portion of the panel member, the fastening means mating and connecting together on folding of the wing members over and into engagement with the lower portions of the anterior portion of the panel member, thereby to secure the panel member about the upper torso of the user;

shoulder belt means connected to the panel member near the opening and extending longitudinally of the body of the user to connection with the supporting structure; and,

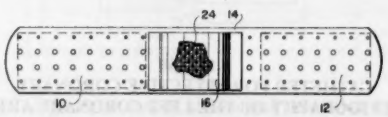
waist belt means connected to the panel member at lower portions of the posterior portion of the panel member and extending transversely of the body of the user to connection with the supporting structure.

4,117,841

MEDICATED BANDAGE POCKET

Anthony Perrotta, and Charles Rollo, both of Box 81 Kensington Sta., Brooklyn, N.Y. 11218

Filed Feb. 7, 1977, Ser. No. 766,244
Int. Cl.[2] A61F 13/00
U.S. Cl. 128—155 6 Claims



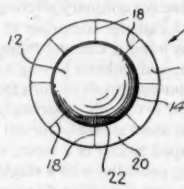
1. A bandage adapted to releasably confine a quantity of active substance therefrom, comprising at least one adhesively coated bandage strip having two opposing surfaces, said adhesive being on one surface thereof, at least one partially rigid pointed member disposed on a portion of said one surface and facing downward away therefrom, a liquid impermeable sheet communicating with said one surface at opposing ends thereof and being spaced apart therebetween forming a cavity exposing said pointed members, said liquid impermeable sheet extending partially over said one surface of said adhesively coated strip, a quantity of liquid or gell active substance disposed in said cavity and adapted to be released therefrom by forcibly puncturing said liquid impermeable sheet.

4,117,842

TREATMENT OF CONJUNCTIVITIS WITH POWDERED ALUMINUM AND EYE PROTECTOR/APPLICATOR

Frank Hutchins, P.O. Box 9035, 67 Pinedale Rd., Asheville, N.C. 28805

Filed Feb. 24, 1977, Ser. No. 771,645
Int. Cl.[2] A61F 13/12
U.S. Cl. 128—163 35 Claims



1. A process for administering powdered aluminum to a diseased eye of an animal afflicted with conjunctivitis, which comprises spraying the powdered aluminum on the inner sur-

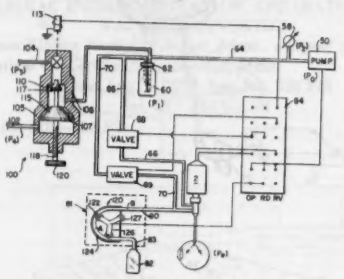
face of an eye protector and mounting said eye protector to cover without contacting the afflicted eye.

4,117,843

SURGICAL OPERATING SYSTEM WITH UPPER PRESSURE LIMIT

Anton Banko, Bronx, N.Y., assignor to Surgical Design Corp., Long Island City, N.Y.

Filed May 12, 1977, Ser. No. 796,361
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—230 **11 Claims**



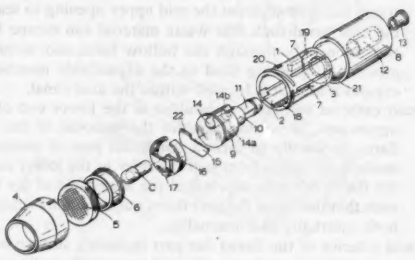
1. A surgical system comprising:
first means including a passage for removing material from an operating site,
second means for infusing a fluid into said operating site,
third means coupled to said second means for infusing a fluid through said passage of said first means in a direction opposite to that of the flow of material being removed from the operating site,
said second means including first control means responsive to the operation of the first means for establishing the pressure of the fluid infused into the operating site at a first predetermined pressure when said first means is operating to remove material from the operating site and responsive to the operation of the third means for establishing the pressure of the fluid infused into the operating site by said third means at a second predetermined pressure which is greater than said first predetermined pressure.

4,117,844

DEVICE FOR DISPENSING MEDICAMENTS

Michael James, Welwyn Garden City, England, assignor to Allen & Hanburys Limited, London, England

Filed Feb. 10, 1977, Ser. No. 767,512
Claims priority, application United Kingdom, Feb. 11, 1976, 5353/76
Int. Cl.[2] A61M *15/00*
U.S. Cl. 128—266 **8 Claims**



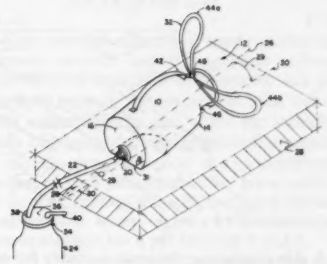
1. An inhalation device for administering to a patient medicaments contained in a capsule, said device comprising a chamber arranged to receive a capsule containing a powdered medicament, at least one air inlet aperture leading into said chamber, a nozzle communicating with said chamber through which air can be inhaled therefrom, a magazine attached to said chamber and slidable and rotatable along and about a longitudinal axis in said chamber and having a longitudinal capsule loading receptacle transversely offset from said axis, said receptacle including means such that a capsule inserted therein will have an end portion projecting from said receptacle into said chamber, a knive coupled to and located in said chamber adjacent said receptacle and having a cutting edge movable across a path intercepting the longitudinal axis of said receptacle whereby rotation of said magazine with respect of said chamber will cause said projecting portion of said capsule located in said receptacle to engage said cutting edge of said knife thereby to sever said projecting portion of said capsule from the remainder of said capsule, and capsule ejecting means mounted on and arranged inside said chamber in a position transversely offset from said longitudinal axis in said chamber and means for rotating and sliding magazine whereby it will enter said capsule loading receptacle when such receptacle has first been registered with said ejecting means by appropriate rotation of the magazine with respect to said chamber and then by sliding said magazine with respect to said chamber thereby to eject the remaining part of said capsule from said loading receptacle into said chamber so that the contents of said capsule may be inhaled through said nozzle, and means for preventing the parts of the severed capsule leaving the chamber when the patient inhales through the nozzle.

4,117,845

BED URINAL APPARATUS

Esther S. Brown, 2000 S. 21st St. East, Salt Lake City, Utah 84108

Filed Sep. 13, 1976, Ser. No. 722,730
Int. Cl.[2] A61F *5/44*
U.S. Cl. 128—295 **5 Claims**



1. Apparatus for continuously collecting urine from bedridden male patients, comprising:
an enclosed vessel shaped and dimensioned for placement between the legs of the patient, said vessel having:
a substantial liquid capacity,
a mouth for receiving the urine of said patient and positioned with respect to said vessel to form a shoulder inhibiting the flow of liquid out from said vessel when said vessel is placed between the legs of said patient, said mouth being smaller in crosssection than said vessel and substantially larger in cross-section than the penis of a male patient,
an outlet adapted for connection to a drain tube, said outlet being formed in said vessel near the natural collection point of liquids when said vessel is positioned between the legs of said patient,
an axis and a base, said base being a substantially flat surface which is oblique to said axis and which intersects said closed end at an angle to orient the axis and in turn the mouth upward when the vessel is placed on the

bed of a patient, said base being sized in area to stably support said vessel when both empty and full of liquids when in place on the bed of the patient between the legs of said patient and a substantial liquid capacity,

a flaring section outward of said mouth which flares outward from said mouth and said axis, and

a handle secured to said vessel;

attachment means for securing said vessel to said patient with said mouth positioned to receive the penis of said patient and with said vessel oriented upward from said bed to place said outlet at about said natural collection point of liquids, said attachment means being comprised of straps of sufficient length to be led over the thighs and around the patient at about his hips and means to secure said straps directly to said enclosed vessel and to each other at their distal ends, and wherein said straps are tensionally secured to said patient to orient said base of the vessel upward from the plane of the mattress of said bed at an angle from about one degree to about two degrees;

an enclosed collection vessel having a vent and positioned below said enclosed vessel to receive urine; and

a tube to interconnect said enclosed collection vessel and said outlet and positioned to permit gravitational flow therebetween.

4,117,846

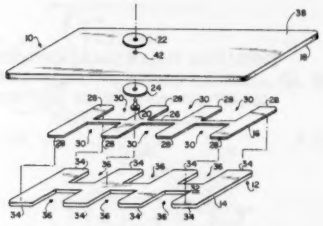
SKIN CONDUCTING ELECTRODE AND ELECTRODE ASSEMBLY

Frank R. Williams, Utica, N.Y., assignor to Consolidated Medical Equipment, Utica, N.Y.

Continuation of Ser. No. 684,317, May 7, 1976, abandoned. This application Jul. 19, 1977, Ser. No. 816,952

Int. Cl.[2] A61N *3/06*

U.S. Cl. 128—303.13 **5 Claims**



1. A skin conducting electrode assembly for use on a patient comprising, in combination, an electrode, said electrode comprising a thin conductive plate having a main body portion and a plurality of projections around the periphery of the main body portion to provide at least one recess in the contour thereof; means for making an electrical connection to said electrode; an adhesive pad in adhesive contact with one side of said electrode; a gel pad in contact with the other side of said electrode, said gel pad extending beyond the peripheral edges of the main body portion and the projections of the electrode, said adhesive pad extending over the at least one recess in the electrode and beyond the outer edges of the gel pad around the entire periphery thereof, the at least one recess between the projections being sufficiently large to insure that when the electrode assembly is placed in contact with a patient, the adhesive pad seals the assembly to the patient around the periphery thereof and within the at least one recess in the electrode to maintain the gel pad and electrode in firm contact with the skin and the gel pad covers the entire face and edges of the electrode to prevent direct contact of the electrode with the skin of the patient.

4,117,847

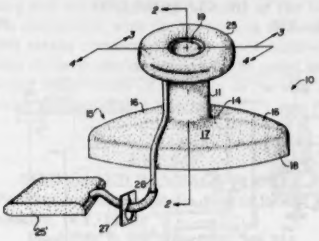
COLON CATHETER

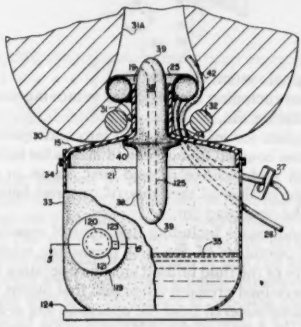
Ralph S. Clayton, 3044 Fillmore Ave., El Paso, Tex. 79930

Continuation-in-part of Ser. No. 655,444, Feb. 5, 1976, abandoned, and a continuation-in-part of Ser. No. 618,471, Oct. 1, 1975, abandoned. This application Apr. 23, 1976, Ser. No. 679,567

Int. Cl.[2] A61M *25/00*

U.S. Cl. 128—348 **53 Claims**





1. A catheter for removing solid and other waste material from the colon through the anal opening comprising:

an elongated hollow tube of solid non-inflatable construction having means defining an upper opening at an upper end of the tube and means defining a lower opening at the lower end of the tube, and including a lumen of sufficient cross-section for the passage of solid waste-colon material from the upper opening therethrough to the lower opening,

the upper part of the tube being rounded and being insertable into the anal opening,

an annular expandable member fixed to and encircling the upper part adjacent the upper opening and constructed to be expanded radially outwardly to circumferentially surround the tube adjacent the said upper opening to seal off the anal canal such that waste material can escape from the colon only through the hollow tube, and including means for directing fluid to the expandable member to expand it after it is located within the anal canal,

said catheter including a shoulder at the lower end of the upper part, at which shoulder the material of the tube flares outwardly to form a flared out part of essentially uniform thickness from said shoulder to the lower end of the flared out part which is at the lower end of the tube, such that the flared out part flares out essentially similarly both externally and internally,

said exterior of the flared out part including surface means extending at least forwardly and rearwardly to lie against the perineum fore and aft of the anal opening to limit movement of the upper part up into the anal opening,

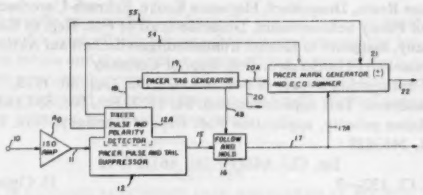
the spacing along the exterior of the tube between the ex-

pandable member and the surface means being such that after the upper part of the tube has been inserted into the anal opening and the expandable member expanded, the anal canal is compressed vertically between the annular expandable member and the surface means to seal the anal canal externally of the tube such that waste colon material flows out only through the tube and including means at the lower end of the tube for securing a collection bag to the enlarged lower end of the flared out part for the passage of waste-colon material out of the enlarged lower end and into the collection bag.

4,117,848
CARDIAC INSTRUMENTATION APPARATUS WITH PACER DIAGNOSTICS

Thomas Kipling Naylor, Belmont, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 1, 1977, Ser. No. 820,523
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PT **8 Claims**


PACER TAG GENERATOR
PACER MARK GENERATOR (+) AND E.C.G. SUMMER
PACER PULSE AND POLARITY DETECTOR
PACER PULSE AND TAIL SUPPRESSOR
FOLLOW AND HOLD

1. In cardiac instrumentation apparatus adapted to receive at an input thereof an ECG signal containing pacer pulses, means for processing at least either said ECG signal or said pacer pulses, and output means for the processed signal, the improvement wherein said processing means comprises:

means for detecting pacer impulses in said ECG signal and for determining the polarity of the respective said detected pacer pulses;

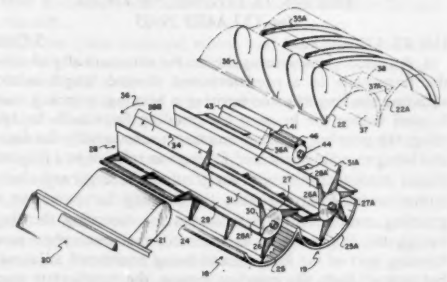
means responsive to said pacer pulse detecting and polarity determining means for generating respective standardized pacer pulse signals representative of the polarity of the respective said detected pacer pulses; and

means for extending said standardized pacer pulse signals to said output means.

4,117,849
ROTARY COMBINE

Daniel Pakosh, Winnipeg, Canada, assignor to Versatile Manufacturing Ltd., Winnipeg, Canada

Filed Sep. 20, 1976, Ser. No. 724,986
Int. Cl.[2] A01F *12/18*
U.S. Cl. 130—27 Q **18 Claims**



17. A rotary combine which includes a wheel mounted supporting framework, crop pick-up means and means to connect the combine to a source of power such as a tractor or the like; said combine comprising in combination a pair of rotary impeller assemblies mounted transversely of the supporting framework, means operatively connecting said crop pick-up means to the side wall of one of said rotary impeller assemblies whereby crop enters said one rotary impeller assembly at right angles to the rotary axis of said rotary impeller assembly, crop transfer means in said one rotary impeller assembly operatively connecting said one rotary impeller assembly with the other said rotary impeller assembly through the side wall of said other rotary impeller assembly and at right angles to the rotary axis of said other rotary impeller asssembly, and discharge means in said other rotary impeller assembly whereby said crop leaves said other rotary impeller assembly at right angles to the axis of rotation of said other rotary impeller assembly, each of said rotary impeller assemblies including means to thresh said crop and separate grain therefrom, and threshing grates in the bases of said rotary impeller assemblies through which grain passes which is separated from said crop, each of said rotary impeller assemblies including a transversely extending substantially cylindrical casing, a drum journalled for rotation within each said casing, a plurality of beater blades secured to and extending substantially radially from said drum, and extending in a continuous manner from one end of said drum to the other, each beater blade lying parallel to the longitudinal axis of said drum and a plurality of spaced and parallel stationary fins secured to the upper portion of each of said casing, said fins in conjunction with said beater blades, moving said crop spirally from where said crop enters said rotary impeller assembly towards where said crop leaves said rotary impeller assembly.

4,117,850
SMOKING MIXTURES

William Malcolm Logan Wood, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 3, 1976, Ser. No. 682,788
Claims priority, application United Kingdom, May 27, 1975, 23151/75
Int. Cl.[2] A24D *1/18*
U.S. Cl. 131—2 **17 Claims**

1. A smoking material comprising smoke-producing fuel, fortifying nicotine, calcium and/or magnesium carbonate as incombustible filler, at least one water-soluble salt selected from water-soluble calcium and magnesium salts, and sodium and potassium sulphate in the case where the incombustible filler is calcium carbonate, and a phsophate buffer consisting of an acid salt of orthophosphoric acid or of a polyphosphoric acid, the amount of such phosphate buffer being sufficient to improve the nicotine stability and such that when the smoking material is slurried with water to give a 15% solution/suspension the aqueous solution has a pH between 6 and 4.

4,117,851
TOBACCO ROD FORMING APPARATUS IN CIGARETTE MAKERS

Athos Cristiani, Via Don Luigi, Sturzo 7, Bologna, Italy

Filed Oct. 6, 1976, Ser. No. 729,743
Claims priority, application Italy, Nov. 18, 1975, 12888 A/75
Int. Cl.[2] A24C *5/18*
U.S. Cl. 131—84 B **4 Claims**

1. Apparatus for forming a continuous cut tobacco braid, comprising

a narrow endless belt type air permeable tape having a bottom run moving at a predetermined speed in a predetermined direction;

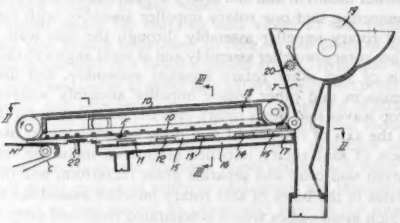
vacuum means for creating a suction through the bottom run of said tape;

means for creating a wide shower of cut tobacco along a line transverse to the direction of movement of the bottom run of said tape;

fixed channel means comprising a longitudinal channel

closed at the top by the bottom run of said tape, and a plurality of feed channels closed at the top and disposed oblique relative to said longitudinal channel;

all of said channels having inlet ends disposed in an orderly series along the width of and communicating with said shower to receive cut tobacco;



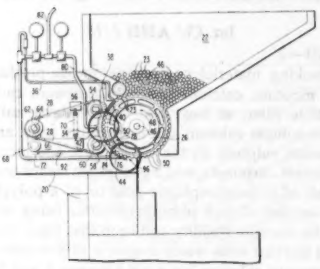
said feed channels having outlet ends spaced longitudinally along and communicating with said longitudinal channel; and means for creating air flow in said channel means moving cut tobacco received from said shower at a speed and direction concordant with the speed and direction of said tape when received thereby.

4,117,852

METHOD AND APPARATUS FOR RECLAIMING TOBACCO FROM CIGARETTES

Thomas A. Newman, Midlothian, and Erich O. Kettner, Richmond, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 31, 1976, Ser. No. 719,473
Int. Cl.[2] A24C *5/36*
U.S. Cl. 131—96 **11 Claims**



1. An apparatus for reclaiming tobacco from cigarettes comprising:

(a) a structural frame;

(b) a hopper carried by said frame for temporarily storing a supply of cigarettes;

(c) conveying means connected to said frame for conveying said cigarettes consecutively from said hopper to points of treatment to remove the tobacco from its surrounding paper tube of each cigarette;

(d) intermediate air jetting means connected to said frame at an intermediate station for introducing a jet of air into a receiving end of each cigarette as the cigarette is conveyed past said intermediate station by said conveying means, a sufficient pressure differential being developed across the length of the cigarette to eject the tobacco from the surrounding paper tube thereof, said air jetting means being comprised of a sealing plate, an air passage disposed in said sealing plate and supplied with air under pressure, and a jetting orifice terminating said passage;

(e) pneumatic positioning means connected to said frame at a first station for consecutively positioning the cigarettes relative to said conveying means to assure direct proximity of said receiving end of each cigarette to said intermediate air jetting means so that the tobacco is ejected from the surrounding paper tube of the cigarette;

(f) sealing means connected to said frame for effecting an essentially hermetic seal between said intermediate air jetting means and said receiving end of each cigarette as the cigarette is conveyed past said air jetting means, said sealing means being comprised of an inclined surface of said sealing plate, against which each cigarette is progressively more firmly pressed as the cigarette is conveyed by said conveying means, said inclined surface surrounding said jetting orifice; and

(g) recovering means connected to said frame for collecting the tobacco ejected from the surrounding paper tubes of the cigarettes.

4,117,853

FILM-FORMING VINYL ACETATE COPOLYMERIZATES IN AN IMPROVED PROCESS FOR SETTING HAIR AND AS HAIR SETTING AGENTS

Günter Reese, Dusseldorf; Hermann Kroke, Erkrath-Unterbach, and Fanny Scheuermann, Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 627,102, Oct. 30, 1975, abandoned. This application Sep. 14, 1977, Ser. No. 833,142
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1974, 2453629
Int. Cl.[2] A45D *7/00;* **A61K** *7/11*
U.S. Cl. 132—7 **15 Claims**

10. In the process of setting hair comprising arranging the hair in the desired configuration and applying a thin film of a film-forming substance on the so-arranged hair, the improvement consisting of utilizing, as said film-forming substance, a film-forming vinyl acetate copolymerizate having a K-value of from 20 to 70, of monomer units consisting of

(a) from 65% to 80% by weight of vinyl acetate units,

(b) from 10% of 20% by weight of units of a maleic acid diester with straight-chained primary alcohols selected from the group consisting of n-octanol-1, n-decanol-1 and mixtures thereof,

(c) from 5% to 20% by weight of units of a mono-olefinically unsaturated ester copolymerizable with vinyl acetate and having from 6 to 8 carbon atoms and a hydrophilic group selected from the group consisting of carboxyl groups, hydroxyl groups and keto groups, and

(d) from 3% to 10% by weight of crotonic acid units, and the salts thereof, in the form wherein at least 50% of the acid groups therein are neutralized.

4,117,854

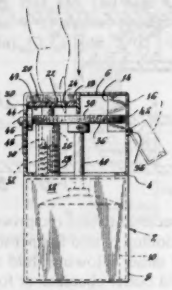
ELECTRIC MANICURE

William J. Rosenbloom, 8 Pioneer Rd., Westport, Conn, 06880

Filed Feb. 10, 1977, Ser. No. 776,295
Int. Cl.[2] A45D *29/05*
U.S. Cl. 132—75,8 **7 Claims**

1. An electric manicuring device for automatically trimming the fingernails to a predetermined desired length without abrading the fingertips comprising a housing, grinding means located within the housing for grinding fingernails for trimming, the grinding means presenting a substantially flat face to and being movably powered for motion relative to a fingernail placed in contact therewith for grinding the fingernail, electric motor means located within the housing for powering the grinding means, touch-plate means for receiving the finger having the fingernail to be trimmed, the touch-plate means forming part of the housing and being positioned adjacent to but spaced from the grinding means, the touch-plate means having an opening therein providing communication with the grinding means for inserting the fingernail, the touch-plate means being yieldingly mounted on biasing means for biasing

the touch-plate away from the grinding means, the biasing means being such that it yields under pressure of the finger to permit the touch-plate means to advance toward the grinding means to enable contact between the face of the grinding means and the fingernail to be trimmed, the touch-plate means



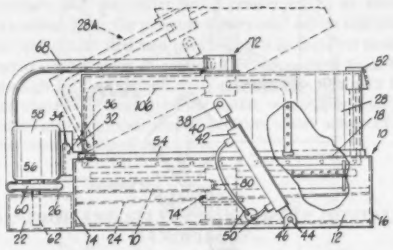
and grinding means being adjustably spaced from one another, means for controllably varying the spacing between the touch-plate means and the grinding means after advance of the touch-plate means under pressure of the finger and setting the spacing to a preselected value determining the length of the fingernail after grinding by the grinding means.

4,117,855

WASHING MACHINE FOR INDUSTRIAL PARTS

Richard J. Olcott, 329 Grand St., Allegan, Mich. 49010, and Ronald H. Cross, 7622 Sprinkle Rd., Kalamazoo, Mich. 49001

Filed May 11, 1977, Ser. No. 795,809
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—141 **10 Claims**



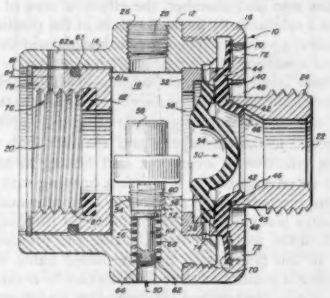
1. An industrial washing machine for machines and machine parts comprising:
- an upright base having a top wall defining a central opening,
- a tank associated with said base and located below the top thereof,
- a collector plate mounted within said base intermediate of the height thereof below said central opening and inclined toward said tank,
- a work supporting grid supported in said base adjacent the plane of said central opening,
- a downwardly opening concave hood movably supported on said top wall and covering said central opening and having a top wall spaced above the top wall of the base,
- said hood and said base forming a washing chamber above said collector plate when said hood is losed on said base,
- power driven means connected to raise said hood to open position above said base and said grid,
- liquid delivery couplings mounted centrally of said collector plate and the top of said hood and projecting in sealed relation thereto into said washing chamber,
- receiving rings rotatably mounted on said delivery couplings interiorly of said washing chamber and arranged to receive liquid from said couplings,
- spray pipes connected to said receiving rings and rotatable therewith in radially extending position therefrom and in liquid communicating relation therewith,
- jet openings formed in said spray pipes directed inwardly of said washing chamber and at angles to planes through the axes of the rings to rotate the pipes and rings about said couplings,
- a pump and driving motor therefor arranged to draw liquid from the tank,
- conduits connected between the outlet of said pump and said liquid delivery couplings exteriorly of said washing chamber,
- the conduit connected to the delivery coupling on the hood being flexible,
- and means forming a drain connection from a low point on said collector plate to said tank.

4,117,856

FROSTPROOF BACKFLOW PREVENTER

Donald E. Carlson, Highland Park, Ill., assignor to Mark Controls Corporation, Lake Zurich, Ill.

Filed Sep. 27, 1976, Ser. No. 726,777
Int. Cl.[2] F16K *24/00*
U.S. Cl. 137—62 **12 Claims**



1. A backflow preventer comprising in combination:
- a housing defining an inlet and an outlet and a chamber between said inlet and said outlet;
- pressure operated valve means mounted within said housing between said chamber and said outlet for preventing flow from said chamber to said outlet when inlet pressure does not exceed outlet pressure;
- a plurality of drain passage means extending from said chamber to the exterior of said housing;
- check valve means for closing said drain passage means when pressure within said chamber exceeds pressure exterior of said housing; a relief port in said housing for establishing communication between said chamber and atmosphere, relief valve means closing said port when ambient temperature is above a predetermined condition, and temperature responsive means for opening said relief valve means to vent said chamber to atmosphere in response to ambient temperature reaching said predetermined temperature condition, said check valve means opening at least some of said drain passage means in response to venting of said chamber to atmosphere, whereby fluid within said chamber may flow outwardly therefrom through said opened drain passage means.

4,117,857

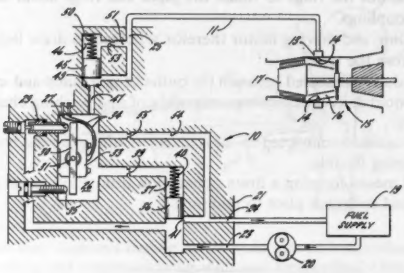
FUEL CONTROL SYSTEM FOR A PRIME MOVER

Garin M. Van De Mark, Fort Collins, Colo., assignor to Woodward Governor Company, Rockford, Ill.

Filed Dec. 22, 1976, Ser. No. 753,262

Int. Cl.[2] F02C 9/10; G05D 11/00

U.S. Cl. 137—117 **4 Claims**



1. A system for supplying fuel to a prime mover, said system comprising a chamber having an inlet and an outlet, said outlet being connected to communicate with said prime mover, means for delivering pressurized fuel into said chamber through said inlet, means for maintaining a substantially constant pressure drop across said inlet when fuel is flowing into said inlet and out of said outlet, a flapper valve supported to pivot within said chamber, means for moving said flapper valve between different positions in which said flapper valve changes the effective area of said inlet thereby to vary the rate of fuel flow into said chamber, the effective area of said inlet varying as a substantially linear function of the position of said flapper valve, a valve member, means biasing said valve member toward a position closing said outlet, a resiliently yieldable seal, said seal being compressed when said valve member is in a position closing said outlet and serving to prevent the flow of fuel from said chamber through said outlet, said valve member being exposed to the pressure in said chamber with said pressure being effective to overcome said biasing means and to hold said valve member in a position opening said outlet as long as said pressure equals or exceeds a predetermined value, and a passage leading from said chamber for bleeding fuel out of said chamber and effective to cause the pressure in said chamber to fall below said predetermined value when said flapper valve is positioned to reduce the fuel flow through said inlet below a predetermined rate whereby said biasing means shift said valve member to a position closing said outlet and compressing said seal to cut off all flow of fuel to said prime mover.

4,117,858

FLAPPER TYPE SPOUT ASSEMBLY

Ernest H. Bucknell, Los Angeles, and Jack K. Rauh, Hacienda Heights, both of Calif., assignors to TRE Corporation, Beverly Hills, Calif.

Filed Oct. 28, 1971, Ser. No. 193,399

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.[2] F16K 31/44

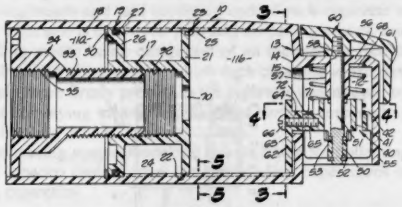
U.S. Cl. 137—119 **5 Claims**

1. A diverter spout assembly comprising

plastic body means including an inlet fluid chamber and an outlet fluid chamber separated by an intermediate partition means having an aperture therein through which fluid mays flow from said inlet chamber to said outlet chamber and having an upstream face,

reciprocal means including a plunger with a plurality of fluid directing vanes forming a nozzle mounted for movement in said outlet chamber, and

plastic flapper means disposed in said inlet chamber for selectively enabling blocking of said aperture in said partition means, said flapper means including a body portion within said inlet chamber and disposed to cooperate with the upstream face of said partition means at said aperture therein, and including a connector extending through said



aperture and secured to said reciprocal means for enabling selective positioning of said flapper means by said reciprocal means for either allowing fluid to flow through said aperture to said outlet chamber or for blocking fluid flow through said aperture.

4,117,859

VALVE

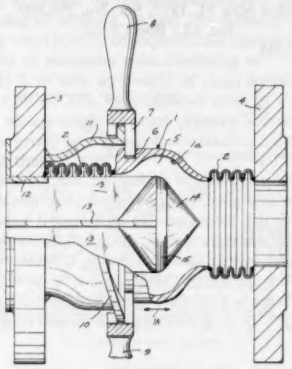
Alois Illy, Limburgerhof, Fed. Rep. of Germany, assignor to Klein, Schanzlin & Becker Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,651

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1976, 2615236

Int. Cl.[2] F16K 31/122, 31/524

U.S. Cl. 137—219 **1 Claim**



1. A valve comprising a body including deformable first and second tubular sections; a valve element disposed in the interior of and spaced apart from said body so that said body and said element define an annular passage for the flow of fluid; and an annular valve seat disposed between and sealingly secured to said tubular sections, said seat being movable axially of said passage with attendant deformation of said sections and relative to said element to thereby change the effective cross-sectional area of said passage; means for moving said seat relative to said valve element, said moving means comprising a helical cam located outside of said body, a follower coupled to said seat and arranged to track said cam, means for moving said follower relative to said cam, said seat having an external circumferential groove and said follower having a portion extending into said groove, and said helical cam, said groove and said follower being positioned so that the said deformable first and second tubular sections are permitted to shift due to conditions other than the operation of the valve, such as temperature change, without affecting operation of the valve and

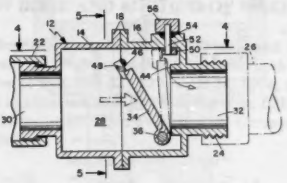
the selected axial position of the seat since the follower will be biased against the helical cam at the same time and the angular position of the follower will not change.

4,117,860

PRESSURE DIFFERENTIAL FLOW RETARDANT VALVE

Jack M. Carlin, R.F.D. Box 135, Del Mar, Calif. 92014

Filed Apr. 8, 1977, Ser. No. 784,962
Int. Cl.[2] F16K *15/03*
U.S. Cl. 137—513.5 **9 Claims**



1. A pressure differential flow retarding valve comprising:
(a) a casing defining a water chamber having an inlet and an outlet;
(b) gate means in said casing movable from a first position substantially seated against said outlet to a second position clear of said outlet and substantially clear of a fluid flow path defined between said inlet and outlet;
(c) means biasing said gate means from said first position to said second position;
(d) bypass means defining a restricted passageway communicating between said inlet and said outlet bypassing said gate means;
(e) a detent which is releasible by the action of an inflow of fluid through said inlet for positioning said gate means in the fluid path between said inlet and outlet, whereby upon the inlet of said valve being connected to a source of high pressure and the outlet being connected to an initially evacuated hose, the pressure differential across said chamber will ensure that said gate means is in said first position and maintain same in said first position until fluid flow through said communication passageway fills said hose and abates said pressure differential, whereupon said gate means moves to said second position under action of said bias means to open said valve.

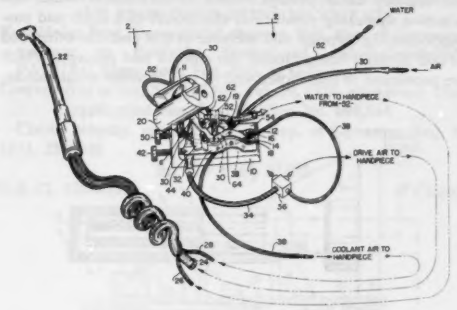
4,117,861

CONTROL AND SELECTOR UNIT FOR DENTAL HANDPIECES

Frank A. Betush, Santa Monica, Calif., assignor to Progressive Machine Products, Inc., Los Angeles, Calif.

Filed Apr. 28, 1977, Ser. No. 791,711
Int. Cl.[2] F16K *7/07*
U.S. Cl. 137—595 **7 Claims**

1. A control unit for controlling the flow of a pressurized fluid comprising: a base; a first resilient strip having one end affixed to said base and having a free end displaced from said base; an actuator mounted on the free end of said first resilient strip in position to move the free end of said first resilient strip between a first position and a second position; a first flexible tube for supplying pressurized fluid from a source to a utilization means positioned to be engaged by a portion of said first resilient strip to be pinched thereby to a closed condition when the free end of said first resilient strip is moved from said first position towards said second position; a second resilient strip mounted on said base adjacent to said first resilient strip and having one end affixed to said base and a free end displaced from said base; coupling means extending between the first and second resilient strips to cause the second resilient strip to be maintained in a second position when the first resilient strip is in its second position; and a second flexible tube for supplying pressurized fluid to the utilization means positioned to be engaged by a portion of said second strip to be pinched thereby



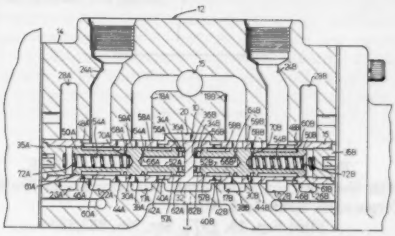
to a closed condition when said second strip is in its second position.

4,117,862

PRESSURE COMPENSATED CONTROL VALVE

Azam S. Qureshi, Racine, Wis., assignor to Tomco, Inc., Racine, Wis.

Filed Feb. 7, 1977, Ser. No. 765,877
Int. Cl.[2] F15B *13/04*
U.S. Cl. 137—596.13 **5 Claims**



1. A pressure compensating hydraulic flow control valve spool assembly for a hydraulic valve having a housing including a main bore, a fluid inlet passage, a tank passage,
a pair of cylinder passages and a pair of exhaust passages connected to said main bore, said valve spool assembly comprising a symmetrical valve spool slidably positioned in said main bore for movement in either direction from a neutral position to operative positions,
and valve means mounted within said spool for providing a pressure controlled flow of fluid between said fluid inlet passage and said tank passage when said spool is in the neutral position, said valve means controlling the flow rate between the fluid inlet passage and one of the cylinder passages when the spool is moved to one of the operative positions.

4,117,863

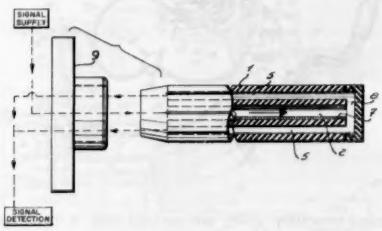
CONTROL DEVICE FOR OPERATION BY THE MOUTH OF A HANDICAPPED PERSON

Jean-Claude Gabus, Hauterive, Switzerland, assignor to Carba S.A., Berne, Switzerland

Filed Mar. 4, 1977, Ser. No. 774,498
Claims priority, application Switzerland, Mar. 26, 1976, 3804/76
Int. Cl.[2] B60K *26/00;* **F16K** *31/04*
U.S. Cl. 137—601 **4 Claims**

1. A selective signalling device for manipulation by the mouth of a handicapped person, said device comprising an

elongated member of resiliently deformable material having an elongated central passage which is non-deformable and at least one radially outer passage which is deformable under the selective squeezing pressure of the mouth of a user, said passages opening through said member at one end, the other end of said member being closed, the ends of said passages which are proximate to said closed end of said member communicating with each other at said closed end of said member, and means for delivering a continuous signal into said central passage from said one end of said member and for measuring the intensity of a return signal from said one end of said at least one radially outer passage, whereby selective deformation of said at least one radially outer passage under the pressure of the mouth of a user restricts said outer passage to change said return signal.

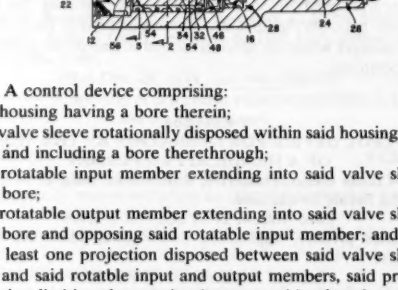


4,117,864

POWER STEERING CONTROL VALVE

Alistair Gordon Taig, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 15, 1977, Ser. No. 833,530
Int. Cl.[2] F15B *9/08*
U.S. Cl. 137—625.23 **14 Claims**



1. A control device comprising:

a housing having a bore therein;

a valve sleeve rotationally disposed within said housing bore and including a bore therethrough;

a rotatable input member extending into said valve sleeve bore;

a rotatable output member extending into said valve sleeve bore and opposing said rotatable input member; and

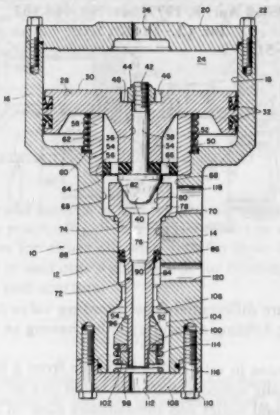
at least one projection disposed between said valve sleeve and said rotatble input and output members, said projection limiting the rotation between said valve sleeve and said rotatable input member and between said valve sleeve and said rotatable output member.

4,117,865

AIR OVER OIL HIGH PRESSURE MODULATING VALVE

Earl A. Beck, 1762 South Erie Pl., Tulsa, Okla. 74112

Filed Nov. 5, 1976, Ser. No. 739,069
Int. Cl.[2] F16K *11/14;* **F15B** *0/42*
U.S. Cl. 137—627.5 **6 Claims**



1. An air over oil high pressure modulating valve comprising housing means having a pneumatic pressure chamber in communication with a longitudinally extending bore, piston means slidably disposed within said chamber, first poppet valve means carried by the piston means and extending into the bore, second poppet valve means slidably disposed within the bore and engageable by said first poppet valve means, valve seat means provided on said second poppet valve means for providing alternate closed and open positions for the first poppet valve means, vent port means provided in the housing in the proximity of the first poppet valve means for venting fluid pressure during opening and closing of said first poppet valve means, valve seat means provided on the inner periphery of the bore for providing alternate open and closed positions for the second poppet valve means, fluid passageway means extending through said second poppet valve means, pneumatic pressure inlet port means provided in communication with said chamber for applying pneumatic pilot pressure to one side of the piston means for selectively controlling the movement thereof within said chamber, hydraulic fluid inlet port means provided in said housing means and in communication with the bore, hydraulic fluid return port means provided in said housing means in communication with the bore for recirculation of hydraulic fluid through the housing, fluid trapping sealing means carried by the second poppet valve means and in sealing engagement with the bore and interposed between the hydraulic fluid input port means and hydraulic fluid outlet port means, hydraulic fluid outlet port means for controlled discharge of hydraulic fluid, said piston means being responsive to the pilot pressure and to pressure differentials acting thereon for closing the first poppet valve in one position of the piston and to preclude return of fluid pressure through the fluid pressure return outlet and for closing the first poppet valve means and simultaneously opening the second poppet valve means in another position of the piston means for providing said controlled discharge of hydraulic fluid through the outlet port means and for simultaneously closing both the first and second poppet valve means in another position of the piston means for trapping controlled hydraulic fluid pressure at the discharge port means, said fluid trapping sealing means cooperating with the trapped fluid pressure for increasing the sealing efficiency of the second poppet valve means in the closed position thereof, and wherein said fluid trapping sealing means comprises an outwardly extending annular shoulder provided on

the outer periphery of the second poppet valve means and interposed between the hydraulic fluid inlet port means and hydraulic fluid return port means, and an annular seal being disposed around the outer periphery of the second poppet valve means and in engagement with the shoulder whereby one face of the seal ring is open at the hydraulic pressure surrounding the poppet valve in the proximity thereof.

4,117,866

HOLLOW BODY AND METHOD OF MAKING THE SAME

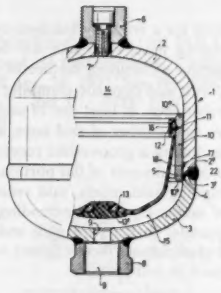
Gerhard Böhm, Elbenweg 15, 7016 Gerlingen, and Rolf Mayer, Kastanienstr. 27, Winnenden-Schelmenholz, both of Germany

Continuation of Ser. No. 517,827, Oct. 24, 1974, abandoned. This application Jun. 1, 1976, Ser. No. 691,411

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1973, 2356796

Int. Cl.² F16L *55/04*

U.S. Cl. 138—30 **1 Claim**



1. A hollow body, especially a pressure vessel, comprising, in combination, two hollow outer parts having annular end faces juxtaposed with one another; an inner tubular part extending to opposite sides of said end faces of said outer parts and having an outer surface closely adjacent to inner surfaces of said outer parts to align the latter with each other; means for fluid-tightly connecting said outer parts with each other including a substantially V-shaped groove formed by said end faces of said outer parts and ending at its apex short of the inner surface of said outer parts, and a fluid-tight weld seam filling said V-shaped groove and connecting said outer parts to each other; means for fluid-tightly connecting said inner tubular part with one of said outer parts including an annular groove provided at the inner surface of one of said outer parts, and a fusible material located in said annular groove between the outer surface of said inner tubular part and the inner surface of said one outer part and forming, after being melted and hardened, a further annular fluid-tight seam for connecting said inner tubular part to said one outer part, said fusible material being different from and of a lower melting point than the material of said weld seam, said annular groove and said fusible material being adjacent to and spaced from said weld seam at a distance sufficient for heat, applied during forming said weld seam, to penetrate into said fusible material so as to melt the same for forming said further seam; and an elastic separating membrane; means connecting said elastic separating membrane to said inner part to separate the interior of the hollow body into two chambers; and means for preventing the fusible material from penetrating to said weld seam during melting said fusible material which fusible material can otherwise detrimentally affect said weld seam, said preventing means including an annular projection provided at the end face of one of said outer parts and extending beyond the apex of said V-shaped groove, and a groove provided at the end face of the other outer part and receiving said projection therein.

4,117,867

HIGH PRESSURE HOSE COMPOSED OF ELASTOMERS AND EMBEDDED REINFORCEMENTS

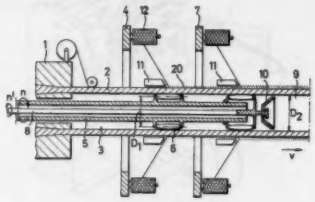
Karl-Heinz Pahl, Dusseldorf-Lohausen, Fed. Rep. of Germany, assignor to Pahl'sche Gummi-und Asbest-Gesellchaft PAGUAG, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 492,558, Jul. 29, 1974, abandoned. This application Jun. 22, 1976, Ser. No. 698,564

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1973, 2338948

Int. Cl.² F16L *11/00*

U.S. Cl. 138—119 **7 Claims**



1. A high pressure hose for use in conveying fluids therein when said hose is under high hydrostatic pressure imposed by a body of water thereabove, said hose made of an elastomeric material and having reinforcing inserts therein, said hose having an inside diameter greater than 300 mm and a jointless length of at least 100 meters.

4,117,868

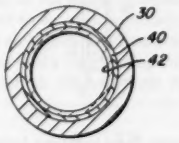
REFRACTORY LINED CYLINDRICAL ARTICLE

Arthur J. Pignocco, Franklin Township, Westmoreland County, and Robert H. Kachik, Washington Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 549,630, Feb. 13, 1975, Pat. No. 4,048,352, which is a continuation-in-part of Ser. No. 332,972, Feb. 15, 1973, abandoned. This application May 2, 1977, Ser. No. 793,021

Int. Cl.² F16L *9/14*

U.S. Cl. 138—146 **5 Claims**



1. A refractory-lined cylinder comprising;

a metal outer shell,

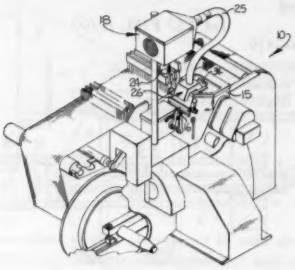
a lining deposited in said shell consisting essentially of the reaction product of an exothermic reaction mixture comprising a powdered fuel metal and a reducible metal oxide, said lining consisting of a first layer consisting essentially of a reduced metal phase metallurgically bonded to said shell and

a second layer overlying said first layer and consisting essentially of an abrasion-resistant refractory metal oxide.

4,117,869
OIL MIST LUBRICATED TEXTILE MACHINE AND METHOD

Reginald Rushman, Lymm, England, assignor to Parks-Cramer (Great Britain) Ltd., London, England

Filed May 20, 1977, Ser. No. 798,935
Int. Cl.[2] D03J 1/00
U.S. Cl. 139—1 R 15 Claims



1. In a textile fabric weaving machine having weaving instrumentalities for interweaving textile strand materials into fabric, and means for lubricating the weaving instrumentalities with airborne fine particles of lubricant, the improvement comprising means mounted on said machine for inducing an airstream to flow adjacent said weaving instrumentalities and for entraining in the airstream airborne fine particles of the lubricant, and (electrostatic filter) means for removing from the airstream and collecting lubricant entrained therein including electrostatic means for precipitating the entrained fine particles of lubricant from the airstream, whereby contamination of areas ambient to the weaving machine by airborne fine particles of lubricant is controlled.

4,117,870
WEFT YARN SENSOR

Miyuki Gotoh, Tokorozawa, Japan, assignor to Nissan Motor Company, Limited, Japan

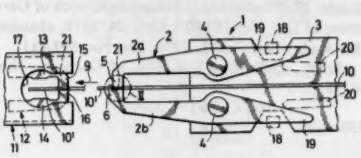
Filed Feb. 28, 1977, Ser. No. 772,565
Claims priority, application Japan, Mar. 4, 1976, 51/23455
Int. Cl.[2] D03D 51/34
U.S. Cl. 139—370.2 9 Claims

1. A weft yarn sensor for a weaving loom, comprising
a sensor body having an aperture and a gap which opens from said aperture externally of said aperture, said sensor body having in use a first position in which a weft yrn is inserted through said aperture and a second position in use in which the weft yarn located in said aperture is taken out from said aperture through said gap, and
first and second electric conductors electrically insulated from said sensor body and both secured to an internal wall surface of said sensor body which defines said aperture, said first and second electric conductors respectively having portions both located in said gap and normally engaged against each other and disengaged from each other when the weft yarn is taken out from said aperture through said gap.

4,117,871
YARN CLAMP FOR A WEAVING MACHINE

Franz Bürer, Kollbrunn, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 19, 1977, Ser. No. 798,352
Claims priority, application Switzerland, Jun. 3, 1976, 6993/70
Int. Cl.[2] D03J 5/06
U.S. Cl. 139—429 8 Claims

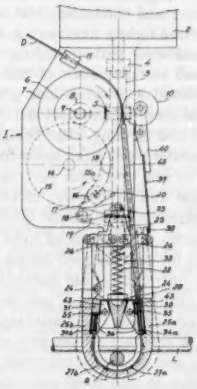


1. A yarn clamp for a weaving machine comprising
a pair of clamping jaws, each said jaw having a clamping surface opposite a clamping surface of the other jaw for registering with said opposite clamping surface to engage a yarn therebetween, at least one of said jaws being movable relative to the other of said jaws, and at least one of said jaws including a groove-like recess in said clamping surface thereof and a pair of flat portions of said clamping surface bounding said recess, said recess being disposed centrally of said one jaw and extending longitudinally of said jaws parallel to the yarn path and over a region in which said clamping surfaces register with each other to receive a yarn in said recess.

4,117,872
BINDING TOOL

Hans Gött; Josef Ritter; Klaus Ritter, and Gerhard Ritter, all of Graz, Austria, assignors to EVG Entwicklungs- u. Verwertungs-GmbH., Graz, Austria

Filed May 23, 1977, Ser. No. 799,522
Claims priority, application Austria, May 25, 1976, 3830/76
Int. Cl.[2] B21F 15/04
U.S. Cl. 140—57 6 Claims



1. A tool for binding an assembly of elements, particularly of crossed reinforcing rods, at least by one binding wire section, comprising:
a support;
means for operatively advancing the binding wire section in

a guide path around the assembly, including a pair of guides mounted on said support for movement toward and away from one another between an open and a closed position thereof, and having respective guide surfaces which together confine the binding wire section to said guide path in said closed position;

means for twisting the respective end portions of the binding wire section with one another, including a twisting head accomodated between said guides for rotation relative thereto and having a pair of twisting components, each of which is located adjacent one of said guides, has a passage for receiving one of the respective binding wire end portions, and has an end which opens onto a respective guide surface of said guides, in respective initial positions of said twisting components, and in said closed position of said guides, and

means for mounting said twisting components on said twisting head for pivoting relative thereto out of said initial positions during the rotation of said twisting head, for said ends of said passages to approach one another, as the twisting of the respective end portions of the binding wire progresses.

4,117,873

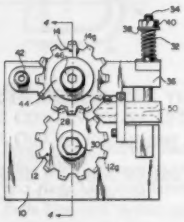
GROOVED-GEAR WIRE PULLER

George W. Crawford, 14 Commerce St., Chatham, N.J. 07928

Filed Apr. 25, 1977, Ser. No. 790,761

Int. Cl.[2] B21F *1/04*

U.S. Cl. 140—105 **3 Claims**



1. Wire pulling means comprising a pair of spur-type gears disposed one above the other, means for positively driving the lower gear of said pair thereof, means biasing the upper gear of said pair into substantially full tooth-meshing relationship with said lower gear, the teeth of both said gears being correspondingly grooved and the grooves thereof being disposed in mutually facing relationship thereby together defining an aperture for the acceptance of the wire to be pulled, means directing said wire in a substantially straight-line path into said aperture, the depth and configuration of said aperture and the degree of bias imparted to said upper gear being such that each pair of the intermeshing teeth first grip the entering wire between their opposite rotating side faces with a continuing high pull force and thereafter deform the gripped wire out of its entering stright-line path and in manner as to impart a succession of longitudinally spaced crimps to the wire exiting from between the intermeshing teeth, said gripping and deforming action being further such as to impart to the exiting wire a tendency to coil itself into a lower level receptacle positioned to receive same.

4,117,874

PORTABLE ARTICLE CARRIER

Antonio Subiros Berenguer, Calle Modolell, 6, Barcelona, Spain

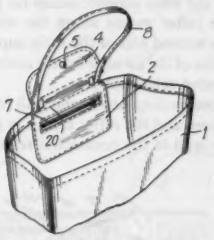
Filed Mar. 22, 1977, Ser. No. 780,191

Claims priority, application Spain, May 6, 1976, 220.945[U]

Int. Cl.[2] B65D *31/00*

U.S. Cl. 150—1.7 **5 Claims**

1. A portable article carrier, suitable to be hand held for carrying goods, comprising a foldable bag having a wall terminating in an upper edge defining an open mouth, and a case smaller than the bag when the latter is in an unfolded condition, said case being secured to the bag adjacent the upper edge thereof, the case having a first compartment formed with an access aperture, the first compartment and its aperture being of such a size and so arranged that the bag when appropriately folded can be stowed therein, the case further having a second compartment adapted for the storage of small objects and



accessible both when the bag is unfolded and when the bag is stowed in the first compartment, said case having an upper edge secured to the bag at the upper edge of the latter and said case hanging down within the bag in the unfolded condition thereof, with said case when hanging down within the unfolded bag having said second compartment facing away from said wall of said bag toward the hollow interior of the bag so as to be freely accessible at the interior of the unfolded bag adjacent the open mouth thereof.

4,117,875

CONTAINERS OR CARRIERS FOR GOODS

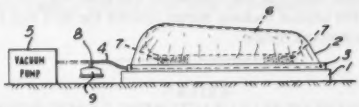
Christopher Daniel Dowling Hickey, 5 Heathside, Hinchley Wood, Esher, Surrey, England

Filed Aug. 16, 1976, Ser. No. 714,656

Claims priority, application United Kingdom, Aug. 18, 1975, 34218/75

Int. Cl.[2] F24F *7/02*

U.S. Cl. 150—52 R **4 Claims**



1. A container of the kind having an impermeable envelope or skin which is at least partly flexible and a vacuum suction means for sucking air out of the container wherein the suction means are adapted to be operated continuously, and wherein there is provided an adjustable bleed orifice open to the atmosphere to admit air into a pipe leading into the vacuum suction duct through which air is drawn from the container.

4,117,876

AWNING FOR A MOBILE HOME

J. Richard Bennett, Fullerton, Calif., assignor to A & E Plastik Pak Co. Inc., City of Industry, Calif.

Continuation of Ser. No. 580,614, May 27, 1975, abandoned. This application May 20, 1977, Ser. No. 798,847

Int. Cl.[2] E04F *10/06*

U.S. Cl. 160—67 **30 Claims**

1. An awning assembly adapted to extend from a wall and comprising:

shelter means forming an awning;

main support means having a longitudinal configuration

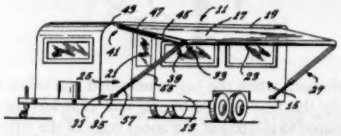
defined by a first end and a second end, the main support means including portions defining a channel extending longitudinally of the main support means;

first bracket means for pivotally attaching the first end of the main support means to the wall; rafter means having a longitudinal configuration defined by a first end and a second end;

second bracket means disposed on the wall for pivotally attaching the first end of the rafter means to the wall;

slide means coupled to the rafter means and slidable in the channel of the main support means for guiding the second end of the rafter means along the main support means toward the second end of the main support means during the operation of the awning from a contracted relationship to an extended relationship;

first locking means disposed on the wall for holding the main support means and the rafter means in a fixed relationship against the wall in the contracted relationship; and



second locking means disposed on the main support means and cooperative with the slide means for holding the main support means and the rafter means in a fixed relationship at the second end of the main support means in the extended relationships of the awning upon the operation of the awning from the contracted relationship to the extended relationship;

the second locking means being actuatable by the slide means to provide for a movement of the slide means in the channel of the main support means past the second locking means in the direction toward the second end of the main support means and thereafter to prevent the movement of the slide means in the channel toward the first end of the main support means, the second locking means extending outwardly from the main support means to an external position for manual actuation and being manually actuatable at the external position to provide for a movement of the slide means in the channel of the main support means past the second locking means toward the first end of the main support means.

4,117,877

METHOD OF MANUFACTURING LARGE-SIZED CENTRIFUGALLY CAST COMPOSITE ROLL AND DEVICE FOR DISPOSING LOWER SIDE POURING SPRUE RUNNER USED IN THE METHOD

Reizo Yokota, Osaka, Japan, assignor to Kabushiki Kaisha Yodogawaseikosho, Osaka, Japan

Filed Nov. 22, 1977, Ser. No. 853,846
Int. Cl.[2] B22D *19/08;* **B22C** *9/20*
U.S. Cl. 164—95 **5 Claims**

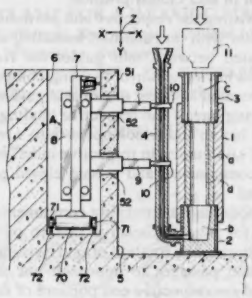
1. A method of manufacturing a large-sized centrifugally cast composite roll, said method being characterized in that it comprises:

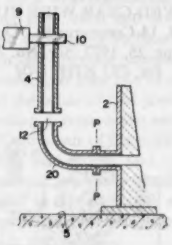
centrifugally casting a body shell by use of a body portion mold;

setting said body portion mold upright inside a casting pit after said body shell was hardened and assembling a shaft portion lower mold with the lower portion of said body portion mold;

positioning a lower pouring sprue runner and holding said runner unswingingly and substantially upright in said casting pit at a predetermined position adjacent said body portion mold but spaced a sufficient distance from said shaft portion lower mold to prevent the transmission of vibration from said shaft portion lower mold to said sprue runner;

quickly connecting said runner to said shaft portion low mold; and





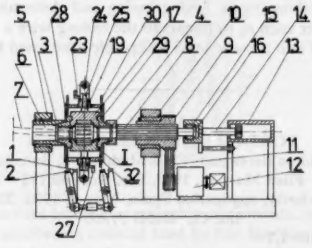
assembling a shaft portion upper mold with the upper portion of said body portion mold; and simultaneously pouring molten metal into said shaft portion upper mold and into said sprue runner into said shaft portion lower mold to integrally cast said body portion shell, said two shaft portions, and said body core portion.

4,117,878

UNIT FOR CENTRIFUGAL CASTING OF METALS IN SPLIT MOULDS

Zenon Najmowicz, Zabrze; Edward Dyrda, Gliwice, and Jan Zakrzewski, Cracow, all of Poland, assignors to Przedsiebiorstwo Projektowania i Wyosazania Zakladow Prezemysly Maszyn i Apartow Elektrycznych "Promel", Gliwice, Poland

Filed Nov. 19, 1976, Ser. No. 743,353
Claims priority, application Poland, Nov. 20, 1975, 184877
Int. Cl.[2] B22D *13/00, 12/00*
U.S. Cl. 164—292 **6 Claims**



1. Centrifugal casting apparatus comprising

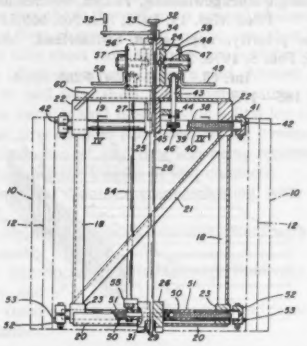
a rotatable sleeve supported at a fixed axial location and having a conically tapered internal surface,
a driving sleeve axially spaced with respect to said rotatable sleeve and having a conically tapered internal surface opposed to the internal surface of said rotatable sleeve,
means for rotating said driving sleeve about an axis or rotation,
means for axially displacing said driving sleeve relative to said rotatable sleeve,
a split mold assembly disposed between said rotatable sleeve and driving sleeve and including a casing and a plurality of mold segments slidably supported by said casing,
means for moving said mold segments radially towards and away from the axis of rotation between a closed mold portion and an open mold position,
locking means for locking said mold segments in the open and closed positions,
core elements secured to said mold segments and cooperatively defining conical elements at respective ends of said mold assembly which face said conically tapered internal surfaces of said sleeves with the mold segments in closed position, said conical elements being of corresponding taper as and engageable in said conically tapered surfaces for driving said mold assembly in rotation,
and means for introducing molten material into said mold assembly via said rotatable sleeve.

4,117,879

FIXTURE FOR USE IN POSITIONING THE WALLS OF AN ADJUSTABLE CONTINUOUS-CASTING MOLD

Kenneth S. Rutherford, Oil City, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 24, 1977, Ser. No. 800,134
Int. Cl.[2] B22D *45/00*
U.S. Cl. 164—412 **6 Claims**



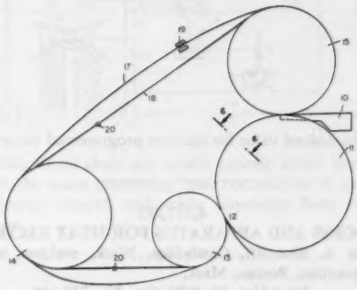
1. A fixture for use in adjusting the positions of the end walls of a continuous-casting mold, said fixture comprising:
a frame adapted to be inserted in a mold;
means on said frame engageable with the mold side walls at their upper and lower edges for centering the frame with respect to the mold;
adjustable means carried by said frame at its opposite sides and adapted to abut the opposed adjustable end walls of the mold when the end walls are in the desired position of adjustment; and
means carried by said frame for moving said adjustable means while maintaining the adjustable means at opposite sides of the frame equidistant from the center of the frame.

4,117,880

TENSIONLESS METALLIC BAND OF HIGH THERMAL CONDUCTIVITY IN A CONTINUOUS CASTING MACHINE

Louis Cimetiere, Meylan, and Richard Gonda, Gieres, both of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Jul. 19, 1977, Ser. No. 816,914
Claims priority, application France, Jul. 27, 1976, 76 23747
Int. Cl.[2] B22D *11/06*
U.S. Cl. 164—433 **4 Claims**



1. A rotary casting machine for casting semi-finished blanks of indefinite length of metal alloys, comprising:
(a) a rotatable casting wheel having a circumferential groove therein;
(b) endless band means adapted to travel at the same linear speed as the casting wheel circumference, and covering a portion of the wheel periphery so as to form with said groove an ingot mold for receiving molten metal;
(c) said band means including a main band formed of a metal having heat conducting properties greater than steel which contacts the casting wheel and a pair of parallel steel bands adapted to be placed under tension and bearing on the lateral sides of the main band on either side of said groove; and
(d) auxiliary wheel means about which said band means passes to place said steel bands under tension wherein said main band is subjected to little or no tensile stressing.

4,117,881

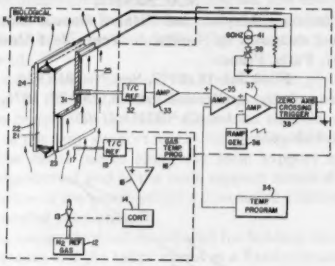
SYSTEM FOR AND METHOD OF FREEZING BIOLOGICAL TISSUE

Thomas E. Williams, Millersville, and Thomas A. Cygnarowicz, New Carrollton, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 14, 1977, Ser. No. 806,440
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—2 **15 Claims**

1. A method of freezing blood cells, bone marrow, and other similar biological tissue located in a container against opposed walls of a pair of heaters, said container having a high thermal conductivity so that the tissue and container are at substantially the same temperature, comprising cooling the container with refrigerating fluid at a time programmed rate at least equal to the maximum cooling rate needed at any time during the freezing process, monitoring the temperature of a surface of the container to derive an indication of the tissue temperature, comparing the indication of the tissue temperature with a time programmed desired value for the tissue temperature to derive

an error indication, and activating the heaters in response to the error indication so that the temperature of the tissue follows the desired value for the time programmed tissue temperature.

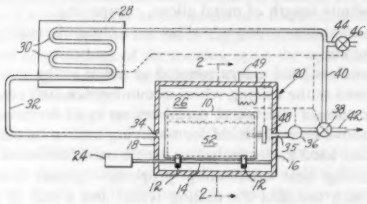


4,117,882

PROCESS AND APPARATUS FOR HEAT EXCHANGE

William A. Shurcliff, Cambridge, Mass., assignor to Broad Corporation, Boston, Mass.

Filed Oct. 26, 1976, Ser. No. 735,418
Int. Cl.[2] F28D *17/00*
U.S. Cl. 165—104 S **13 Claims**



1. Apparatus for storing thermal energy for subsequent use which comprises:

means for exposing a heat exchange liquid to a heat source,

means for passing the heated liquid into a first container which is in heat exchange relationship with a salt hydrate composition enclosed in at least one sealed container,

said salt hydrate having a heat fusion of at least about 50 BTU/lb,

the volume ratio of the heat exchange liquid in said first container to said salt hydrate being between about 1 to 20 and 2 to 1,

means for agitating each sealed container continually to minimize or prevent supercooling of said salt hydrate,

means for monitoring pressure within said sealed container,

and means for periodically passing said heat exchange liquid from heat exchange relationship with said salt hydrate to extract heat from said liquid.

4,117,883

HEAT RETRIEVER

William F. Feldmann, R.R. #1, O'Fallon, Ill. 62269

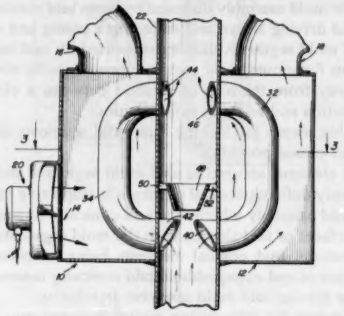
Filed Aug. 30, 1976, Ser. No. 718,909
Int. Cl.[2] F28F *9/02;* **F24B** *7/00*
U.S. Cl. 165—174 **4 Claims**

1. A heat retriever, comprising, in combination:

(a) a shell provided with an inlet and an outlet for permitting a fluid to be heated to be passed through the shell;

(b) a vent pipe attachable to a flue pipe of a furnace and arranged extending through the shell; and

(c) a plurality of retriever pipes each connected to and arranged in parallel with the vent pipe and disposed entirely within the shell for forming a bypass around a portion of the vent pipe for combustion gases received from the associated furnace flue pipe and exposing the fluid to be heated to a larger heat transfer surface, and the vent pipe including restrictor means for diverting the combustion gases from the vent pipe to the retriever pipes, the restrictor means including opposed deflector fins terminating the retriever pipes at an entrance of the retriever pipes and being extensions thereof into the vent pipe and disposed



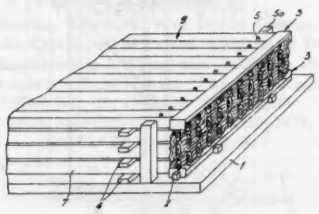
upstream of a flow of combustion gases through the vent pipe, the fins being downstream of the entrance to the retrieve pipes and extending into the vent pipe for diverting combustion gases into the retriever pipes, the retrictor means further including a hollow, frustum of a cone disposed within the vent pipe downstream from the entrance to the retriever pipes for providing a resistance to the flow of combustion gases and causing the combustion gases to flow into the retriever pipes as a path of less resistance.

4,117,884

TUBULAR HEAT EXCHANGER AND PROCESS FOR ITS MANUFACTURE

Willi Frei, St. Gall, Switzerland, assignor to Air Fröhlich AG für Energie-Rückgewinnung, Teufen, Switzerland

Filed Mar. 19, 1976, Ser. No. 668,527
Claims priority, application Switzerland, Mar. 21, 1975, 1390/75; Feb. 5, 1976, 361/75
Int. Cl.[2] F28D *1/04;* **F28F** *9/04*
U.S. Cl. 165—175 **7 Claims**



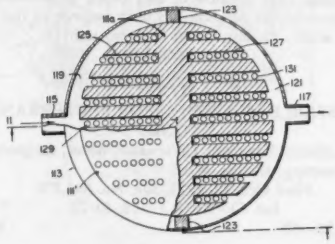
1. A tubular heat exchanger comprising a plurality of heat exchange tubes placed in a stacked, spaced-apart relationship and disposed substantially parallel to each other in the vertical and horizontal direction, each of the opposing end portions of said plurality of tubes being adheringly embedded in a wall of a hardened, elastic material, disposed transverse to the longitudinal direction of said tubes, said wall at both end portions of said tubes sealably separating an inner zone defined by the space around said tubes from the end zones which communicate with the space within said tubes, metal profile bars sealably adhering to the wall of the elastic material at the uppermost and lowermost sides of said stack and at both opposing

end portions of said tubes, said plurality of stacked tubes being disposed on a base plate, said base plate containing a plurality of spacer elements which extend substantially vertically from said base plate for providing horizontal separation between adjacent rows of heat exchanger tubes and additional spacer elements disposed transverse to the longitudinal direction of the heat exchanger tubes for providing vertical separation between adjacent rows of heat exchanger tubes, said tubular heat exchanger being adapted to handle a first medium through the tubes themselves via said end zones and a second medium which flows around said tubes, transverse to said tubes through said inner zone.

4,117,885
SLAB HEADER

James H. D. Nickerson, and Robert R. Steel, both of St. Catharines, Canada, assignors to Foster Wheeler Limited, St. Catharines, Canada

Continuation of Ser. No. 510,327, Sep. 30, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,849
Int. Cl.[2] F28F *9/02;* F28D *7/06;* F22B *37/10*
U.S. Cl. 165—176 **8 Claims**



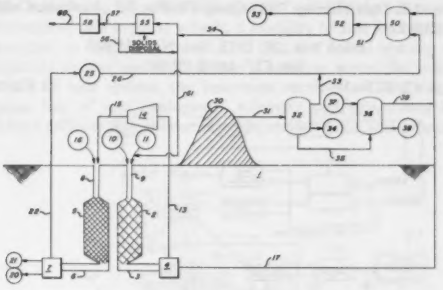
1. A heat exchanger comprising:
a vessel;
a tube sheet disposed within said vessel and having a first channel extending less than half way into said tube sheet from the periphery thereof and a second channel aligned with said first channel and extending less than half way into said tube sheet from the opposite periphery thereof;
a plurality of tubes perpendicular to said channels and connected to said tube sheet for communication with said channels, each of said tubes having a first leg connected with said first channel and a second leg connected with said second channel, said tube legs being received in said channels along the lengths of said channels;
a first peripheral chamber communicating with said first channel;
a second peripheral chamber communicating with said second channel;
means for introducing a heat exchange fluid into said first chamber, and
means for removing said heat exchange fluid from said second chamber.

4,117,886
OIL SHALE RETORTING AND OFF-GAS PURIFICATION

Donald E. Honaker, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 19, 1977, Ser. No. 834,570
Int. Cl.[2] B01D *53/34;* E21B *43/00, 43/24*
U.S. Cl. 166—259 **4 Claims**

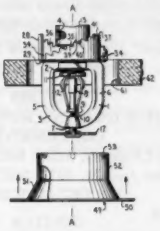
1. A process for removing acidic impurities from off-gases generated in the retorting of oil shale in the combustion of off-gases comprising:
contacting a rubblized mass of oil shale which has been substantially depleted in hydrocarbonaceous materials with water, so as to extract basic components from the mass; and
contacting off-gases, which were generated during the retorting of oil shale and which contain acidic impurities, with the water containing basic components so as to substantially remove said acidic impurities from said off-gases.



4,117,887
SPRINKLER HEAD FLANGE ASSEMBLY

James R. Anderson, Berwyn, Pa., assignor to Central Sprinkler Corporation, Landsdale, Pa.

Continuation-in-part of Ser. No. 724,736, Sep. 17, 1976, Pat. No. 4,066,129. This application Apr. 13, 1977, Ser. No. 787,001
Int. Cl.[2] A62C *37/12*
U.S. Cl. 169—37 **8 Claims**

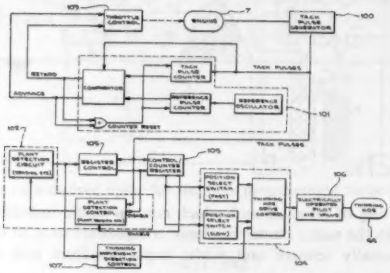


1. A sprinkler head assembly for mounting with respect to a surface comprising:
(a) a sprinkler head body having a nozzle therein;
(b) a bracket attached to said body and having a plate extending radially outwardly therefrom and a ring extending normally of said plate at the periphery thereof, said ring having at least one upwardly directed channel dividing said ring and open at opposite ends thereof, one of said channel ends corresponding with a notch in said plate, means on said ring forming at least one engageable shoulder circumferentially offset from said channel;
(c) an annular flange receiving said body thereinto and surrounding said bracket, said flange being telescopically movable over said bracket and having at least one boss thereon projecting inwardly thereof a distance greater than the radial thickness of said ring and blocking said movement in absence of alignment with said channel, said flange being supported on said bracket by circumferential alignment with axial movement of said boss through and beyond said notch and channel and rotation of said boss relative to said bracket into engagement with said shoulder; and
(d) a support member on said flange and adapted for engaging said surface.

4,117,888
NOVEL FIELD CROP-THINNING APPARATUS AND METHOD

Lawrence W. Fuller, 7655 Bradley Rd., Moorpark, Calif. 93021, and E. Dale Hawley, 7891 Camp Chaffee Rd., Ventura, Calif. 93001

Filed Nov. 28, 1975, Ser. No. 635,905
Int. Cl.[2] A01B *79/00*
U.S. Cl. 172—1 1 Claim



1. A method of accurately and rapidly thinning commercial plantings of field crops by a motor-driven apparatus including a plant-sensing system and associated thinning knives and provided with pneumatic means for moving thinning knives through cutting strokes and electrically operable valves for supplying the pneumatic means with pressure fluid, comprising:

converting the r.p.m. of the driving motor into timing pulses;

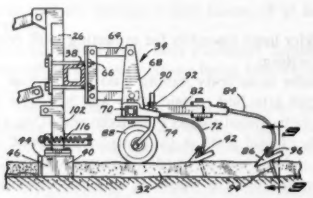
utilizing said pulses to maintain the apparatus at a virtually uniform rate of travel;

and utilizing said pulses to energize the plant-sensing system and said valves in desired preset sequence and intervals initiated by the plant-sensing system.

4,117,889
APPARATUS FOR GUIDING ROW CROP PROCESSING IMPLEMENTS

John C. Larson, Clements, Minn. 56224

Filed Jan. 21, 1977, Ser. No. 761,373
Int. Cl.[2] A01B *69/00*
U.S. Cl. 172—26 4 Claims



2. In combination with laterally movable implements for moving over the ground to establish the location of crop rows in a field and for processing crops in those rows, apparatus for establishing a guide trench in precise parallel relation to such crop rows and for guiding said row crop processing implements using said trenches, said apparatus including:

A. a plurality of vertical guide block support bars fixedly positioned with respect to each of said implements in spaced relation to each other in direction transverse to the moving direction of the implement to which they are fixedly positioned;

B. a plurality of vertical guide blocks, each firmly mounted with respect to a lower end of one of said support bars to have position beneath the surface of the ground on which the implement to which it is mounted is supported and to lie in a vertical plane in parallel relation to the direction of travel of that implement as it moves over the field;

C. each such block including a relatively short wedge-shaped leading edge portion and an elongated flat plate-like trailing portion; and

D. wherein said means for firmly mounting each guide block with respect to a lower end of one of said support bars includes:

(1) a guide block pivot plate pivotally mounted with respect to a lower end portion of said support bar;

(2) means for attaching said guide block to said guide block pivot plate, said means including a guide block attachment plate integral with a lower end of said pivot plate, a guide block plate integral with an upper edge of said guide block and removable fastening means to connect said guide block plate and said guide block attachment plate;

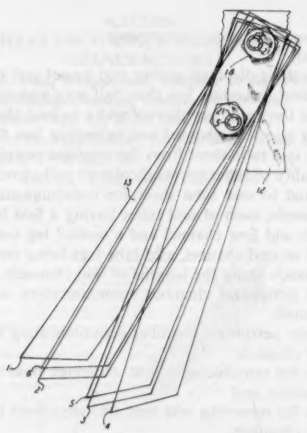
(3) resilient means for urging said pivot plate and said guide block to move forwardly in the direction of motion of said implement; and

(4) stop means fixed with respect to said support bar and said pivot plate for limiting the forward motion of said guide block to position whereby said wedge-shaped leading edge portion of said block is in substantially perpendicular relationship with respect to the ground on which the implement is supported.

4,117,890
ADJUSTABLE MOUNTING FOR SUBTERRANEAN TOOL

Stephen Anthony Youngers, Clearwater, Kans., assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 25, 1977, Ser. No. 844,576
Int. Cl.[2] A01B *13/08, 35/26*
U.S. Cl. 172—40 9 Claims



1. An adjustable mounting for a subterranean tool, comprising two spaced-apart mounting pins, a subterranean tool having two multi-sided openings spaced apart at the spacing of said pins to be respectively aligned with said pins and being respectively larger than the cross-section of said pins and each of said openings having an axis central with respect to all the sides of each of said openings, a multi-sided bushing snugly removably disposed in each of said openings and having an eccentric hole therein offset from said central axis of each of said openings and being of a cross-sectional size to respectively snugly receive each of said pins, said multi-sided openings and said multi-sided bushings being symmetrical and identically shaped for removal and rotation of said bushings about their respective central axes and for re-insertion snugly into said

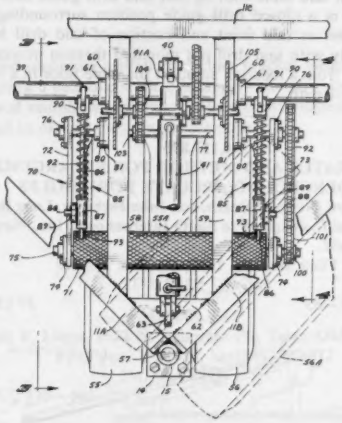
openings for re-positioning said eccentric holes relative to said tool, and with said eccentric holes being spaced apart a distance identical to the spacing between said pins in co-ordinated rotation and re-insertion of said bushings, for adjusting the angle of said tool relative to said pins.

4,117,891

GROUND DRIVE FOR GRAIN DRILLS

Chester G. Neukom, Jamestown, N. Dak., assignor to Haybuster Manufacturing, Inc., Jamestown, N. Dak.

Filed Mar. 21, 1977, Ser. No. 779,338
Int. Cl.[2] A01B *33/00*
U.S. Cl. 172—105 **12 Claims**



1. In an agricultural implement having a first shaft to be driven in relation to ground speed and including a frame, wheel means supporting said frame for movement over the ground including caster wheel means having dual wheels rotatable about a common generally horizontal axis and a support for said dual wheels pivotally mounted to said frame about an upright axis, said caster wheel means being free to pivot sufficiently to permit turning of said implement, a drive roller, means to support said drive roller relative to said frame adjacent said caster wheel means for rotation about an axis, said means to support including means to permit movement of said roller from a position spaced from said caster wheel means to position engaging said caster wheel means to rotationally drive said roller, means drivably connecting said roller to said first shaft, said drive roller having an axial length along its axis of rotation sufficient so said roller engages both of said dual wheels when the frame is moving in a normal direction of movement during working and continues to be driven as the caster wheel means caster during turning of the implement.

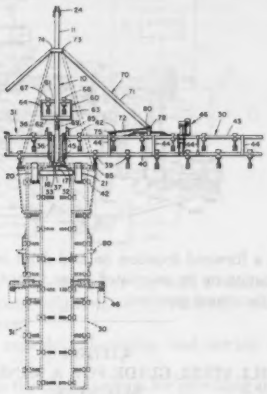
4,117,892

AGRICULTURAL FOLDING TOOL BAR WITH RIGID CROSS FRAME

William John Dietrich, Sr., Congerville, and Cary Leon Sizelove, Eureka, both of Ill., assignors to DMI, Inc., Goodfield, Ill.

Filed May 19, 1977, Ser. No. 798,632
Int. Cl.[2] A01B *73/00*
U.S. Cl. 172—311 **6 Claims**

1. In a folding tool bar system for agricultural use, including a main frame adapted to be pulled by a traction vehicle; support wheels on said main frame; first and second wings pivotally mounted to said main frame adjacent the center thereof for movement between a use position in which the inboard ends of said wings are side by side and said wings extend outwardly of said main frame and transverse of the direction of travel of said vehicle, and a road travel position in which said wings extend rearwardly of said main frame and parallel to the direction of travel of said vehicle; and a plurality of ground engaging implements carried on said wings at equal lateral spacing, the improvement comprising a rigid cross frame rigidly secured to said main frame at a position forward of said folding wings and forward of said support wheels, a plurality of said implements attached to said cross frame such that the lateral spacing of adjacent ones of said implements is uniform across the entire width of said system, the innermost sections of said wings being free of said implements, whereby said wings may be folded rearwardly without interference between said support



wheels and implements on said wings; first and second articulated link means for rigidly holding said wings alternatively in an extended use position or a folded road travel position, each of said link means including a first rigid link, a second rigid link pivotally connected to an associated wing, means for interconnecting said first and second links together while permitting articulation between them, and means for pivotally attaching said first link to said main frame at a position forward of said cross frame, and arranged such that said first link and said cross frame do not interfere when said wings are folded rearwardly in said road travel position.

4,117,893

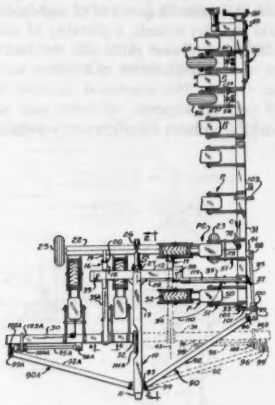
AGRICULTURAL TOOL BAR

Jon Eugene Kinzenbaw, P.O. Box 525, Williamsburg, Iowa 52361

Continuation of Ser. No. 644,547, Dec. 29, 1975, abandoned. This application Sep. 9, 1977, Ser. No. 831,744
Int. Cl.[2] A01B *73/00*
U.S. Cl. 172—311 **9 Claims**

1. An agricultural tool bar comprising: a main frame having a forwardly extending draft member adapted to be pulled by a traction vehicle, said frame further providing first and second pivotal mounting locations; first and second support beams; means for mounting said first and second support beams respectively to said first and second mounting locations for pivotal motion about respective vertical axes to permit each support beam to be rotated between a use position in which said beam extends outwardly and transverse of the direction of travel of said vehicle, and road travel positions in which said beam extends rearwardly and parallel to the direction of travel of said vehicle; first and second link means, each link means including first and second rigid links pivotally connected together, one of said links being pivotally connected to said draft member at a location forward of its associated beam in the use position, and the other link being pivotally connected to its associated beam at a location outboard of the vertical rotational axis for said beam, said first and second links of each link means cooperating with each other such that when the associated beam is in the use position, one of said links extends be-

tween said draft member and an outboard location on said beam to hold said beam extended in the use position, and when said beam is in the travel position, one of said links extend



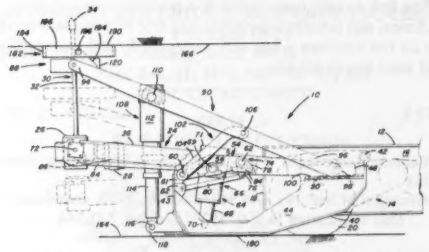
between a forward location on said draft member and a forward location on its associated beam to hold said beams rearward in the travel position.

4,117,894

DRILL STEEL GUIDE FOR A MINE DRILLING MACHINE

Daniel Saunders, Mount Clare, W. Va., assignor to Mining Equipment Division, a division of FMC Corporation, Fairmont, W. Va.

Filed May 4, 1977, Ser. No. 793,723
Int. Cl.[2] E21C *11/02*
U.S. Cl. 173—23 **9 Claims**



1. In a mine drilling machine, a drill steel guide comprising,

a support frame,

a drill boom assembly having a front end portion and a rear end portion, said drill boom assembly rear end portion pivotally connected to said support frame for vertical pivotal movement of said drill boom assembly front end portion relative to said support frame,

means for pivoting said drill boom assembly adjacent said rear end portion thereof relative to said support frame so that said front end portion moves in a vertical linear path,

a drill pot pivotally connected to said front end portion of said drill boom assembly and operable to carry an upwardly extending drill steel therefrom,

a separate drill guide boom assembly extending in parallel overlying relation with said drill boom assembly and having a front end portion and a rear end portion,

pivot means for connecting said drill guide boom assembly to said support frame for moving said drill guide boom assembly front end portion in a vertical linear path,

a drill guide carriage mounted on said drill guide boom assembly front end portion,

a pair of drill guide members pivotally secured to said drill guide carriage for movement toward and away from each other,

said drill guide members each having a guide portion,

actuator means linked to said drill guide members for pivoting said drill guide members to move said guide portions to a closed drill guide position surrounding the drill steel and an open position, and

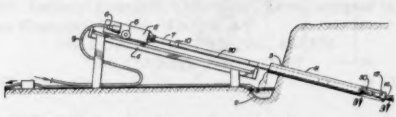
said drill guide carriage being supported by said drill guide boom assembly front end portion above said drill pot, said drill guide boom being movable upwardly to a location adjacent the mine roof to position said drill guide carriage adjacent said mine roof so that said drill guide members remain in a closed drill guide position surrounding the drill steel as said front end portion of said drill boom assembly with said drill pot mounted thereon moves upwardly from a location adjacent the mine floor in a vertical linear path.

4,117,895

APPARATUS AND METHOD FOR ENLARGING UNDERGROUND ARCUATE BORE HOLES

Howard Ward, Newport Beach, and John Tschirky, Long Beach, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Mar. 30, 1977, Ser. No. 782,847
Int. Cl.[2] E21B *3/12*
U.S. Cl. 175—53 **37 Claims**



1. An apparatus for enlarging a bore hole extending from one surface location to a terminal exit end at a remote location: said apparatus including a pipe extending from said one surface location into said bore hole, means at the surface to impose a thrust on said pipe, a hole opener assembly attached to said pipe at one side of said hole opener, said bore hole extending from said exit end to said hole opener, a swivel connected to said hole opener at the other side thereof, a member extending longitudinally in said bore hole to said exit end and connected to said swivel, and means positioned at the exit end to apply a pull to said member while said hole opener is rotated, means to circulate drilling fluid through said pipe, and means to rotate said hole opener.

35. The process of drilling a bore hole from one entry location to another exit location which comprises drilling a pilot hole between said locations by advancing a bit at the end of a drill string from said entry location to said exit location, providing thrusting means at said entry location and pulling means at said exit location, introducing a hole opener mounted on a pipe into said pilot hole at said one of said locations, circulating drilling fluid through said pipe and hole opener, and advancing said hole opener by pulling on said hole opener with said pulling means from said exit location and pushing on said pipe and hole opener with said thrusting means for said entry location while rotating said hole opener.

4,117,896

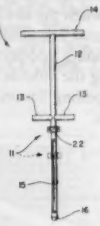
SOIL SAMPLER

Jerome B. Weber, 6300 Lewisand Ct., Raleigh, N.C. 27609

Filed Jul. 11, 1977, Ser. No. 814,446
Int. Cl.[2] G01N *1/00*
U.S. Cl. 175—84 **4 Claims**

1. A soil type sampling device comprising: a tubular like main shaft being open at one end and having a handle means

attached adjacent the other end; an elongated, slot-like opening in said shaft adjacent said open end; and a soil sample surface removal means slidably mounted on said shaft adjacent said



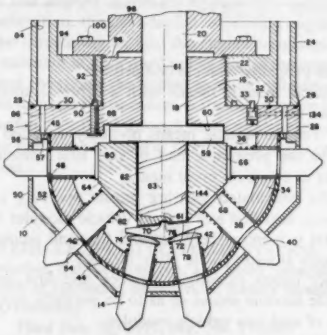
slot and including a shaft encircling bracket means pivotably mounting a bale like surface scrapper whereby surface soil of said soil sample which may become contaminated can be removed to expose the true sample core.

4,117,897

DRILL BIT

Donald E. Lloyd, 1622 N. Delaware Pl., Tulsa, Okla. 74110

Filed Jun. 13, 1977, Ser. No. 805,812
Int. Cl.[2] E21B *1/06*
U.S. Cl. 175—106 **9 Claims**



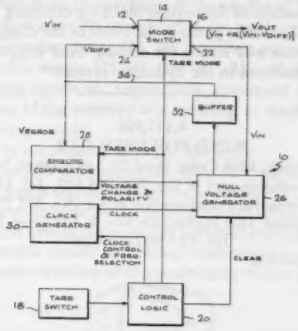
1. Drill bit means comprising rotatable eccentric cam means, non-rotatable bearing means disposed around said cam means, apertured inner housing means carried by said bearing means and surrounding a portion of said cam means, cutting tool means reciprocally disposed in each aperture of the inner housing means and having one end engagable with the cam means and the opposite end extending exteriorly of the inner housing means, lubrication chamber means provided in said inner housing means and around said cam means for lubrication of the cutting tool means, seal means provided for said inner housing means for precluding leakage of fluid therefrom, apertured outer housing means carried by said bearing means and substantially concentrically arranged with respect to said housing means, the apertures of said outer housing means being in substantial alignment with the apertures of the inner housing means for loosely receiving the cutting tool means therethrough, and fluid chamber means provided in said outer housing means for receiving fluid and discharging said fluid around the cutting tool means for facilitating the drilling operation.

4,117,898

ELECTRONIC TARE SYSTEM FOR ELECTRICAL BALANCE

Kenneth J. Moriyama, Placentia, Calif., assignor to Ventron Corporation, Beverly, Mass.

Filed Jul. 29, 1977, Ser. No. 820,114
Int. Cl.[2] G01G *23/14*
U.S. Cl. 177—165 **14 Claims**



1. An electronic tare system for use with a balance which generates an electrical weight signal representing a mass being weighed, comprising:

counter means capable of counting and storing a count therein;

means coupled to the counter means for providing an electrical counter signal representing a count in the counter means;

means responsive to a tare command for causing the counter means to count to a value at which the electrical counter signal is equivalent to the electrical weight signal; and

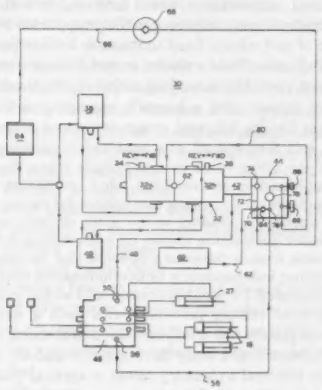
means for thereafter algebraically combining the electrical counter signal with the electrical weight signal.

4,117,899

HYDRAULIC SYSTEM FOR A SKID-STEER LOADER

Thomas M. Sagaser, Gwinner, and Joseph M. Mather, Lisbon, both of N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 10, 1977, Ser. No. 767,265
Int. Cl.[2] B62D *11/04*
U.S. Cl. 180—6.48 **2 Claims**



1. An improved port block for the hydraulic system of a skid-steer vehicle, the block including a first outlet port for

carrying fluid to a hydraulic control pump of the system, a first inlet port for receiving fluid directed from a hydraulic reservoir provided in the system, a second inlet port for receiving fluid directed from an implement operating means provided in the system, a second outlet port for directing fluid to an inlet port of a pair of hydrostatic drive pumps provided in the system, fluid passages provided in the port block and disposed between said inlet and outlet ports, fluid filtering means provided in a passage of the porting block, by-pass means provided in a passage of the porting block for directing the flow of fluid to the hydraulic pump in the event of the clogging of said filtering means and means for sensing fluid temperature and pressure conditions in the hydraulic system.

4,117,900

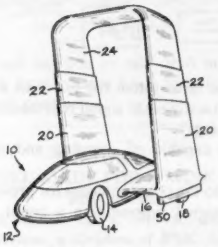
WIND-POWERED CAR

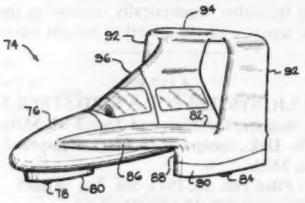
James L. Amick, 1464 Cedar Bend Dr., Ann Arbor, Mich. 48105

Continuation-in-part of Ser. No. 705,627, Jul. 15, 1976, abandoned, which is a continuation of Ser. No. 577,778, May 15, 1975, abandoned. This application Nov. 9, 1977, Ser. No. 849,888

Int. Cl.[2] B62D *57/04*

U.S. Cl. 180—7 R **16 Claims**





1. A wind- and motor-powered land vehicle with a fore-and-aft longitudinal axis comprising a body supported by wheels, at least one of said wheels fixed to rotate in a plane parallel to the fore-and-aft axis of said vehicle, an airfoil system comprised of at least one vertically extending airfoil rigidly mounted on said body and topped with a laterally extending airfoil in an arrangement having bilateral symmetry about a vertical plane through said fore-and-aft axis, said airfoil system providing a forward propelling force to said vehicle when the airfoil system is subjected to certain cross-wind conditions, said airfoil system including a retracting mechanism for raising and lowering said laterally extending airfoil when desired, and self-contained motor propulsion means on said vehicle for providing acceleration from a stationary position and for propelling the vehicle either independently or in combination with propelling forces generated by wind action on said airfoil system.

11. A land vehicle provided with both a wind-powered propulsion system and a self-contained propulsion system, said vehicle comprising a body having a fore-and-aft longitudinal axis with bilateral symmetry about a vertical plane through said fore-and-aft axis, front and rear wheels supporting said body, at least one of said wheels fixed to rotate in a plane parallel to said fore-and-aft axis, an airfoil system including at least one substantially vertical airfoil having a portion of its leading edge forward of the center of gravity of the vehicle thereby to counteract yawing moments produced by airfoil portions behind the center of gravity of the vehicle, said airfoil system being mounted in fixed relationship with respect to said longitudinal vehicle axis whereby to provide a forward propelling force of said vehicle when the airfoil system is subjected to certain wind conditions, and self-contained propulsion means on said vehicle for providing acceleration from a stationary position and for propelling the vehicle either independently or in combination with propelling forces generated by wind action on said airfoil system.

4,117,901

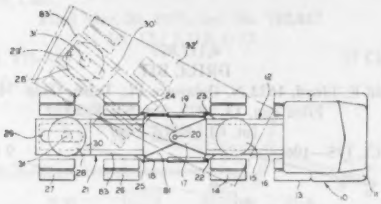
SELF-PROPELLED ARTICULATED VEHICLE

Lyle V. Mustered, Streator, Ill., assignor to Anthony Company, Streator, Ill.

Filed Nov. 22, 1976, Ser. No. 743,622

Int. Cl.[2] B60K *17/34*

U.S. Cl. 180—51 **13 Claims**



1. A self-propelled vehicle comprising:

first vehicle module means with a driver control portion located therein;

second vehicle module means pivotally attached at a first end to the proximate end of said first vehicle module means at a vehicle pivot means;

hydraulic articulated steering means operably connected between said first and second vehicle modules to actuate pivotal movement between said first and second vehicle modules at said vehicle pivot means;

container means extending between said first and second vehicle module means so as to be partially supported by each of said two vehicle modules,

said container means being pivotally attached to said first vehicle module at a first support pivot means between a second end and a first end of said first module,

said container means being pivotally attached to said second vehicle module at a second support pivot means between said first end and a second end of said module;

said container means having travel means proximate one of said two container support pivot means on said first and second vehicle modules through which said container travels when said first vehicle pivots relative to said second vehicle module at said vehicle pivot means; and

air operated container distribution means associated with one or more axles of said modules to alternatively raise or lower the position of said container relative to said axle to in turn enable selective weight distribution of a load in said container means;

each of said two vehicle modules having at least two vehicle axles apiece;

each of said two axles on each of said vehicle modules having at least two wheels emerging therefrom.

4,117,902

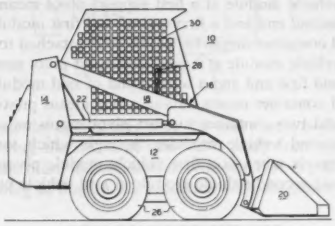
ENGINE COOLING SYSTEM FOR A SKID-STEER LOADER

John W. Henline; James J. Bauer, both of Lisbon, and James O. Morehouse, Havana, all of N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 7, 1977, Ser. No. 766,109

Int. Cl.[2] B60K *11/04*

U.S. Cl. 180—54 R **2 Claims**



1. A cooling system for a skid-steer vehicle, the vehicle having a body portion, uprights mounted on the body portion at the rear thereof and on opposite sides, a boom assembly carried on the uprights and extending forwardly downwardly on opposite sides of the vehicle, an engine compartment defined by the uprights, support means underlying the engine compartment, a rear closure having ventilating openings therein, a front panel and an upper structure, the cooling system providing, an engine mounted in the engine compartment at the rear of the skid-steer vehicle on the support means provided, a fan mounted in closely spaced relation at the rear of the engine and aligned therewith to provide a compact fan-engine combination, the fan adapted to provide negative pressure to draw circulating air into the engine compartment, and a radiator mounted at a forward upper end of the engine compartment and overlying the engine mounted therein whereby air is drawn through the openings in the rear closure compartment by the fan, circulates through the compartment, and exits through the radiator provided at the forward upper end of the compartment.

4,117,903

VEHICLE SPEED CONTROL SYSTEM

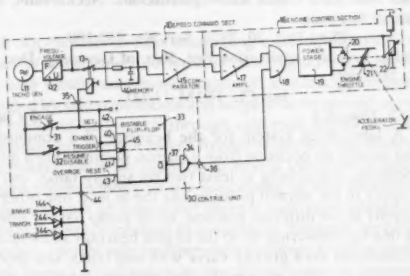
Helmut Fleischer, Schwieberdingen, and Erich Schneider, Kirchheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 22, 1977, Ser. No. 770,595

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1977, 2609867

Int. Cl.[2] B60K *31/00*

U.S. Cl. 180—105 E **10 Claims**



1. Vehicle speed control system having

a vehicle speed transducer (**11**, **12**) providing an actual vehicle speed signal;

a memory (**14**) to store a commanded vehicle speed providing a command vehicle speed signal;

operator means (**15**) comparing the commanded and actual speed signals and providing a control output signal;

means (**16**, **20**) providing a control positioning output to affect the speed of operation of the engine of the vehicle;

and a control unit (**30**) connected to the memory (**14**) and to the positioning means (**16**, **20**) including manually operable switch means (**31**, **32**; **31'**, **32'**; **31''**, **32''**) providing switching signals to, respectively, command enabling or disabling of the memory and enabling or disabling of the positioning means

wherein, in accordance with the invention

the control unit (**30**) comprises only two manual operable switch means and further comprises a bistable circuit (**33**), the operating state of the bistable circuit being controlled by at least one of the manually operable switch means and said bistable circuit (**33**) being connected to control enabling and disabling of the positioning means (**16**, **20**).

4,117,904

VEHICLE SPEED CONTROL SYSTEM

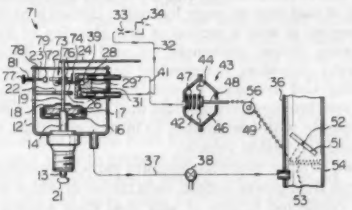
Hiroshi Matsubara, Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1977, Ser. No. 820,155

Claims priority, application Japan, Aug. 5, 1976, 51-104075[U]

Int. Cl.[2] B60K *31/00*

U.S. Cl. 180—108 **5 Claims**



1. A vehicle speed control system comprising:

actuator means for controlling a vehicle speed in accordance with applied fluid pressure;

vehicle speed sensing means having a shaft, an angular position of the shaft corresponding to vehicle speed; and

modulator means connected between a fluid pressure source and the actuator means for modulating fluid pressure in accordance with the angular position of the shaft, the modulator means comprising:

means for forming a fluid stream;

a fluid control plate rotatably supported by the shaft for variably blocking the fluid stream in accordance with an angular position of the plate;

a friction disc fixed to the shaft;

a bifurcated spring fixed at a closed end thereof to the plate and having bifurcations normally frictionally engaging in substantial diametric opposition with a periphery of the disc thereby connecting the plate to the disc for unitary rotation; and

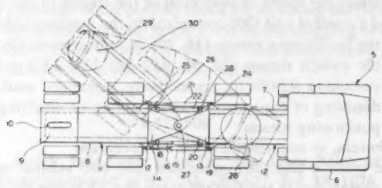
a cam movable into engagement with the spring at an open end thereof for moving the bifurcations away from each other and out of engagement with the disc to disconnect the plate from the disc, the cam moving the spring and disc to an angular center position.

4,117,905

STEERING SYSTEM FOR ARTICULATED VEHICLES

Lyle V. Mustered, Streator, Ill., assignor to Anthony Company, Streator, Ill.

Filed Nov. 22, 1976, Ser. No. 743,621
Int. Cl.[2] B62D *5/10*
U.S. Cl. 180—139 **21 Claims**



1. A steering system for articulated vehicles having two or more vehicle modules pivotally connected to one another at a pivot attachment, said steering system comprising:

steering actuation means;

a plurality of hydraulic telescoping steering means;

each of said plurality of hydraulic steering means pivotally connecting said two or more vehicle modules and pivotally positioned proximate to said pivot attachment respectively;

dual fluid control means operably connected to said steering actuation means to control and synchronize the operation of each of said plurality of hydraulic telescoping steering means; and

two or more hydraulic circuitry path means operably connected with said dual fluid control means,

a first of said two or more hydraulic circuitry path means powering at least one of said plurality of hydraulic steering means proximate to said pivot attachment, and a second of said two or more hydraulic circuitry path means powering at least a second of said plurality of hydraulic steering means proximate to said pivot attachment, thereby providing independent hydraulic power means among said hydraulic telescoping steering means which are synchronized through said dual fluid control means to cooperate with one another to in turn effectuate steering of said articulated vehicle,

said two or more hydraulic circuitry paths comprising a dual circuit fluid power system, each circuit of which is operably connected to one of said dual fluid control valves respectively so as to power said respective hydraulic telescoping steering means;

said plurality of hydraulic steering means comprising four hydraulic double-acting cylinders;

a first and second of said four double-acting cylinders positioned on first and second sides respectively of said pivot attachment and powered by said first hydraulic circuitry path means;

a third and fourth of said four hydraulic double-acting cylinders positioned on said first and second sides respectively of said pivot attachment and powered by said second hydraulic circuitry path means.

4,117,906

LINEAR TRAVEL DEVICE FOR SELF-PROPELLED ARTICULATED VEHICLE

Lyle V. Mustered, Streator, Ill., assignor to Anthony Company, Streator, Ill.

Continuation-in-part of Ser. No. 743,622, Nov. 22, 1976. This application Apr. 29, 1977, Ser. No. 792,269
Int. Cl.[2] B62D *5/06*
U.S. Cl. 180—139 **4 Claims**

1. A self-propelled articulated vehicle comprising:

first vehicle module means with a driver control portion located therein;

second vehicle module means pivotally attached at a first end to the proximate end of said first vehicle module means at a vehicle pivot means;

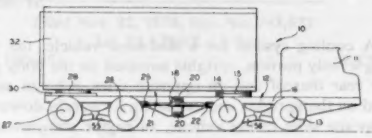
hydraulic articulated steering means operably connected between said first and second vehicle modules to actuate pivotal movement between said first and second vehicle modules at said vehicle pivot means;

container means extending between said first and second vehicle module means so as to be partially supported by each of said two vehicle modules,

said container means being pivotally attached to said first vehicle module at a first support pivot means between a second end and a first end of said first module,

said container means being pivotally attached to said second vehicle module at a second support pivot means between said first end and a second end of said module; and

said container means having travel means proximate one of said two container support pivot means on said first and second vehicle modules through which said container travels when said first vehicle module pivots relative to said second vehicle module at said vehicle pivot means,



said travel means comprising linear travel platform means affixed to one of said first and second vehicle module means so as to enable reciprocating movement of said platform means relative to said vehicle module,

said support pivot means affixed to said travel platform means to provide for rotation of said container means;

said linear travel platform means comprising an inverted substantially U-shaped platform member having inwardly returning flange arm members at its lower end,

said U-shaped member being separated from said vehicle module by one or more slide and rail means interposed between its upper end and said returning flange arm members at its lower end,

said U-shaped platform maintained in place about said vehicle module by said inwardly returning flange arm members which encompass a portion of said vehicle module thereby precluding separation of said platform means from about said slide and rail members and in turn said vehicle module;

said platform means having means for fixed attachment of said support pivot means.

4,117,907

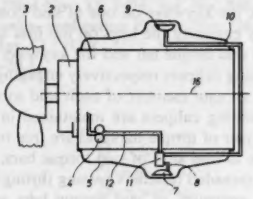
DEVICE FOR ASPIRATION OF LUBRICATING OIL FROM THE SUPPLY OF A COMBUSTION ENGINE

Rolf Lechler, Neckarsulm, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Dec. 20, 1976, Ser. No. 752,200
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557888
Int. Cl.[2] F01M *11/00*
U.S. Cl. 184—6.2 **3 Claims**

1. A lubrication system for the bearings of a combustion engine moved on occasion from a normal position into a different position, comprising at least two oil supply tanks, one for the supply in the normal position and the at least one other for the supply in the different position, an oil pump having a delivering line for delivering oil to the engine bearings and a suction line connected via a gravity valve with said tanks, said gravity valve having a valve body with a first end position corresponding to said normal position, in which the connection with the tank associated with said normal position is opened and the

connection with the other tank is shut off, and a second end position corresponding to said different position in which the connection with the tank associated with said different position



is opened and the connection with the other tank is shut off, whereby during the travel of said valve body from one end position to the other the connection with one tank is positively shut off as long as there is a connection with the other tank.

4,117,908

ELEVATOR HAVING ROPE GUIDE MEANS

Toshihiko Nara; Norihiko Mitsui, and Masayuki Shigeta, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 14, 1972, Ser. No. 306,457
Int. Cl.[2] B66B *11/04*
U.S. Cl. 187—20 **11 Claims**

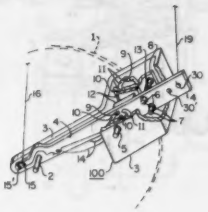
1. An elevator system comprising a winch provided on the floor of a machinery room, rope means adapted to be wound on said winch, an elevator cage and a balancing weight suspended by said rope means and adapted to be moved vertically by means of said winch through said rope means, and a rope vibration suppressing means fixedly secured at the floor of the machinery room for suppressing lateral vibration of said rope means independently of the positioning of said elevator cage along the path of movement thereof, said rope vibration suppressing means including two members disposed opposite one another, each of said members being arranged with a clearance with respect to said rope means and arranged to contact said rope means only when said rope means vibrates laterally so as to suppress the vibration thereof.

4,117,909

WHEEL TORQUE FEEDBACK CONTROLLED FRONT BRAKE

Yao T. Li, Lincoln, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 697,888, Jun. 21, 1976, abandoned, which is a continuation of Ser. No. 552,815, Feb. 25, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,752
Int. Cl.[2] B60T *8/00;* **F16D** *55/08*
U.S. Cl. 188—2 A **2 Claims**



1. A braking-torque controlled brake apparatus for a vehicle having a frame and a wheel to be braked, said wheel having an axle, said brake apparatus comprising:

a first lever pivotally attached at one of its ends to the axle of said wheel,

a second lever pivotally attached between its ends to the other end of said first lever,

a brake disc attached to said wheel,

a brake pad attached to one of the levers and responsive to one direction of relative rotation between said first and second levers to apply a braking force to said wheel by causing said pad to press against said disc,

a pretensioned spring, a first cable,

a brake lever attached to one end of said second lever through the pretensioned spring and the first cable to provide said one direction of relative lever rotation in response to activation of said brake lever and to thereby apply a braking force to said wheel,

a second cable attached between said frame and to the other end of said second lever to provide a reaction force to said second lever to prevent the rotation of said second lever about the axle when a braking force is applied,

said brake pad being closer to the point of attachment of the second cable point on said second lever than to the point of attachment of said first cable on said second lever to cause said reaction force to be greater than said braking force,

said pretensioned spring limiting the maximum braking force in relation to the force required to elongate said pretensioned spring.

4,117,910

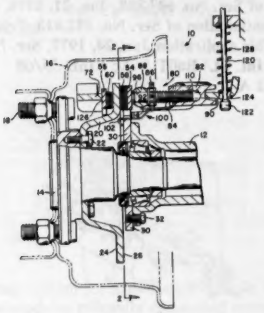
DISC BRAKE AND MOUNTING THEREFOR

Donald D. Johannesen, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 720,015, Sep. 2, 1976, abandoned. This application Aug. 26, 1977, Ser. No. 828,012
Int. Cl.[2] F16D *65/56*
U.S. Cl. 188—71.9 **1 Claim**

1. A disc brake comprising a rotor, support means spaced from and adjacent to said rotor, a frame cooperating with said support means for sliding and pivoting relative to said support means, a pair of friction elements carried by said frame on opposite sides of said rotor, adjustment means disposed between one of said friction elements and said frame, said adjustment means comprising a nut engaging said frame to prevent rotation relative to the same, a push bar engaging said one friction element and a stem between the push bar and nut, said stem having a projection engaging the push bar, a threaded

section opposite the projection engaging the nut and a star wheel intermediate the projection and threaded section, said star wheel providing rotation of the stem to engage the threaded section with the nut thereby moving the push bar into



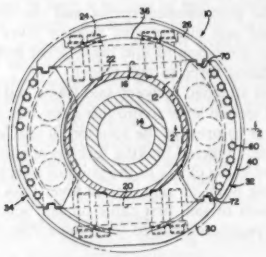
engagement with said one friction element to move the same closer to said rotor, and a spring member engaging and frame and support means to bias said frame to allow disengagement of said friction elements and rotor and cooperating with said star wheel to fix the rotation of the star wheel relative thereto.

4,117,911

TORQUE BARS FOR SLIDING CALIPER DISC BRAKE

Dusan M. Vacval, Cicero, and E. A. Domes, Carpentersville, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 1, 1977, Ser. No. 820,519
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.3 **9 Claims**



1. A floating caliper disc brake assembly comprising:

an axle housing having an axial center point, said axle housing having a pair of torque bar receiving pads provided thereon, each of said torque bar receiving pads being a flat surface having a plurality of threaded bores and formed on said axle housing, each of said torque bar receiving pads located on opposite sides of said axial center point of said axle housing such that said flat surfaces of said torque bar receiving pads are parallel to each other;

a pair of torque bars having flat mounting surfaces on the inboard side thereof, one of said pair of torque bars being mounted on one of said torque bar receiving pads and the other of said pair of torque bars being mounted on the other of said torque bar receiving pads, each of said torque bars having a plurality of apertures through said mounting surface, said mounting surface dimensions being similar to said flat surface of said torque bar receiving pad, each of said torque bars having first and second arcuate members on each end thereof connected by a vertical support, each arcuate member having a key at the extremity thereof, said keys projecting perpendicularly outward from said inboard side of said torque bar;

a pair of floating calipers located between said pair of torque bars, each floating caliper having a keyway at each end thereof dimensionally compatible with said keys in said torque bars, the keyways on one of said floating calipers respectively engaging the keys on the first arcuate member of each said torque bar and the keyways on the other of said floating calipers respectively engaging the keys on the second arcuate member of each said torque bar such that said floating calipers are maintained in position between said pair of torque bars and are free to move laterally relative to said keys of said torque bars;

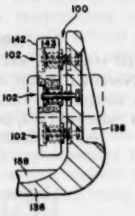
a plurality of threaded fasteners passing through said plurality of said apertures of said torque bars and into said plurality of threaded bores of said torque bar receiving pads to attach said torque bars to said torque bar receiving pads.

4,117,912

MEANS FOR REDUCING THE GAP BETWEEN ROTOR-BACKING PLATE INTERFACE DURING BRAKE DEPRESSURIZATION

Joseph P. Ruppe, Jr., South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 18, 1977, Ser. No. 816,242
Int. Cl.[2] F16D *55/48, 65/22*
U.S. Cl. 188—216 **10 Claims**



9. A wheel and brake assembly for an aircraft comprising:

a wheel member rotatably mounted on said aircraft;

torque-absorbing means mounted on said aircraft and carrying a backing plate member;

fastener means for attaching a first friction surface to said backing plate member;

brake application effecting means including a pressure plate member extending generally parallel to said backing plate member and slidably relative to said torque-absorbing means, said pressure plate member having a second friction surface;

rotor members and stator members located between the pressure plate member and the backing plate member, said rotor members and stator members being slidable on said wheel member and on said torque-absorbing means respectively, each of said rotor and stator members carrying third friction surfaces;

said brake application effecting means including means for moving said pressure plate member toward the backing plate member to urge said third friction surfaces into frictional engagement with one another in response to a brake signal and thereby effect a brake application; and

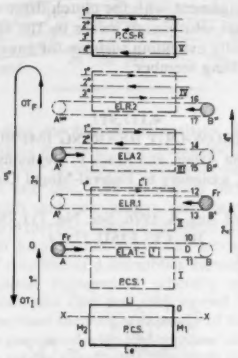
resilient means defining a yieldable connection between said backing plate member and said first friction surace for urging said first friction surface away from said backing plate member and toward said pressure plate member when said brake is released.

4,117,913

PROCESS AND MACHINE FOR SMOOTHING PRINTED WIRING-CIRCUIT PLATES

Julienne Lévy, Saint Louis, France, assignor to Telettra International, Luxembourg, Luxembourg

Filed Nov. 11, 1976, Ser. No. 740,820
Claims priority, application France, Nov. 24, 1976, 75 35787
Int. Cl.[2] B23C *3/13, 3/12;* B23Q *1/18*
U.S. Cl. 90—15.1 1 Claim



1. A machine for cutting off wires permanently secured to a printed circuit board and having free ends extending from one side of said board, said machine comprising at least one smoothing tool consisting of a milling-cutter revolving at high speed, and means for moving the printed-circuit board, said machine further comprising:

a multi-component device including a first screw-driven carriage for moving the board in a transverse direction in relation to a lengthwise axis of the board, and in the same plane as that of the board,

a device including a pneumatically controllable carriage for imparting a translational travelling movement to the smoothing tool along the lengthwise axis of the board to sever said wires, said cutter passing within a distance of less than 1.6 mm. of said one side of said board,

a control device coupled to the board-moving device, to control transverse movements of the board and initiate the lengthwise movement of the smoothing tool on completion of each transverse movement of the board,

reversing means responsive to completion of each lengthwise movement of the smoothing tool, for causing an incremental transverse movement of the board and a lengthwise movement of the smoothing tool on completion of the incremental transverse movement of the board, said lengthwise movement of the smoothing tool taking place in the direction opposite to that of the previous lengthwise movement,

means for disposing the board on the transverse-movement device, locking the board in position and initiating the first transverse movement of the board, said locking means comprising a pneumatic jack for holding the board on said first carriage, said locking device comprising a sloping surface and being coupled to said holding jack for immobilizing the board on the first carriage when the holding jack is operated to move the locking device in a predetermined direction,

means for causing the components forming the board-moving device to return to the original positions thereof on completion of a series of said transverse movements, and

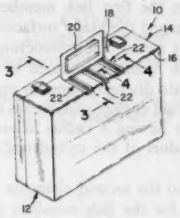
switch means for stopping the machine when a protective cover is removed, to prevent accidents.

4,117,914

SLIDABLE SUITCASE HANDLE

John M. Snyder, 186 Riverside Dr., New York, N.Y. 10024, assignor to John M. Snyder; Bernard J. Steinberg, both of New York, N.Y. and Edward Halle, Fort Lauderdale, Fla.

Filed Jun. 22, 1977, Ser. No. 809,060
Int. Cl.[2] A45C *13/26*
U.S. Cl. 190—58 R 9 Claims



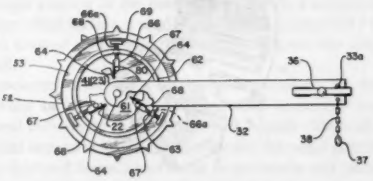
1. An item for carrying material comprising a main body portion, comprising a top portion, comprising at least one top edge and at least one central portion and a carrying handle characterized in that the carrying handle is slidably connected to the top portion of the item by means which selectively permit sliding movement of the carrying handle from the central top portion to the edge top portion of said item; in which the means to selectively permit sliding movement of the carrying handle comprises at least one slide holder secured on said edge portion and said central portion of said top portion to slidably recieve said handle.

4,117,915

RECIPROCATING LEVER FRICTION DRIVE MECHANISM FOR A BICYCLE OR OTHER OCCUPANT PROPELLED VEHICLE

Timothy Tung Jen Young, 788 Walnut St., Apt. 2, San Carlos, Calif. 94070

Continuation-in-part of Ser. No. 628,074, Nov. 3, 1975, Pat. No. 4,063,747. This application Nov. 5, 1976, Ser. No. 739,351
Int. Cl.[2] B62M *1/04;* F16D *13/08, 13/14;* F16H *7/06*
U.S. Cl. 280—255 10 Claims



1. In an occupant propelled vehicle including a frame, a ground engaging wheel mounted on said frame, a driven sprocket for rotating said wheel, a drive sprocket, a drive shaft freely journaled concentric to said drive sprocket, a first lever arm fixed to one end of said shaft, a second lever arm rotatable on the other end of said shaft; an attachment shaft journaled on said frame, a first cable having one end attached to the tip of one of said lever arms and the other end wound clockwise on said attachment shaft, and a second cable having one end attached to the tip of the other of said lever arm, and the other end wound counterclockwise on said attachment shaft, and a turn-buckle with right-and-left threaded screws fitted to each of said cable whereby the cable length may be adjusted, and a compression spring mounted on said turn-buckle for moving into stopping engagement with said attachment shaft to limit the travel of said cables, and a leverage adding weight suspended from the tip of each of said lever arms by a link chain;

the improvement comprising a ratchet mechanism for driving said driving sprocket, said mechanism consists of: a first element having cylindrical engagement means, radially inward of the sprocket teeth and attached to the sprocket wheel so as to extend axially from both sides of the sprocket wheel; a pair of second elements coaxial with a adjacent either side of the first link members integrally connected to the said second elements; second link members with brakes surfaces on the radially outward ends extending from the first link members and adapted to frictionally engaged the brake surfaces with the cylindrical engagement means; the connection between the first and second link members adapted to flex or extend the brake surface into disengagement or engagement with the cylindrical driving engagement means of the first element;

the brake surface having a radius of arc substantially the same as the radius of the cylindrical drive engagement means;

a band attached to the second elements with radially symmetrical holes for the link members to flex and extend through;

a guardplate mounted as a buffer against reflex angles in the member connection in extension;

and where the flexion of the member connection results in the disengagement of the brake with the cylindrical engagement means, extension of the connection results in the friction drive engagement.

4,117,916

BEARING CARRIER FOR A CLUTCH RELEASE BEARING

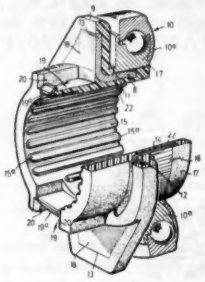
Peter Frederick Baker, Conway, Great Britain, assignor to Quinton Hazell Limited, Colwyn Bay, England

Filed Oct. 18, 1976, Ser. No. 733,233

Claims priority, application United Kingdom, Oct. 24, 1975, 43742/75

Int. Cl.[2] **F16C** *35/06;* **F16D** *23/00*

U.S. Cl. 192—98 **8 Claims**



1. A clutch release bearing assembly comprising:

a clutch release bearing having inner and outer races with rolling elements therebetween; and

a bearing carrier which carries the inner race and which is adapted to be slidably mounted on a drive element of a clutch and to be engaged by a clutch operating member so that a clutch disengaging force applied to the inner race is transmitted thereform, by the rolling elements, to the outer race and hence to the clutch mechanism,

the bearing carrier including a metal insert and a synthetic plastics part,

the metal insert comprising a tubular portion and a flange portion,

said flange portion providing a transverse abutment surface adapted to be engaged by the clutch operating member,

said tubular portion having an external surface on which a bearing seating surface is located and defining a bore which provides an internal surface,

the inner race of the bearing directly engaging said seating surface and being retained on the carrier solely by metal-to-metal engagement with said seating surface,

the plastics part being fixedly moulded onto the insert so that relative movement between the insert and the plastics part is prevented,

the pastics part including a tubular portion extending within said insert bore and covering the internal surface of said insert tubular portion and defining a bearing surface for bearing engagement with the clutch drive element,

the plastics part also having means on the exterior thereof defining axially extending surfaces for engagement by the clutch operating member.

4,117,917

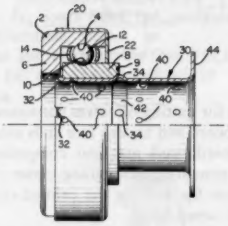
CLUTCH THROW-OUT BEARING IMPROVEMENT

Eli M. Ladin, Ann Arbor, and Mark P. Reynolds, Birmingham, both of Mich., assignors to Federal-Mogul Corporation, Detroit, Mich.

Filed Aug. 4, 1976, Ser. No. 711,753

Int. Cl.[2] **F16D** *23/14*

U.S. Cl. 192—98 **5 Claims**



1. A clutch throw-out bearing assembly including an antifriction bearing with a first annular race member containing a first annular raceway and an annular face adapted to contact clutch release fingers during axial shifting movement of said bearing assembly, a second annular race member containing a second annular raceway and a plurality of antifriction elements constrained between said first and said second raceways, said antifriction bearing being mounted upon and securely affixed to an annular bearing carrier adapted to engage a clutch actuation means for effecting axial shifting of said bearing assembly the improvement comprising,

said bearing carrier formed from sheet metal and including a longitudinally extending seam defined by opposed abutting edges of said bearing carrier, and coacting means on said opposed edges disposed in interlockingly engaged relationship,

means including a radial flange at one end portion of said bearing carrier adapted for engagement with a clutch actuation means,

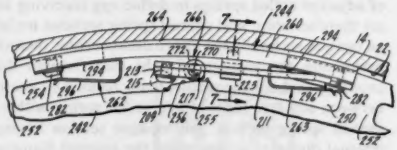
lubricant retention means on the inner circumferential surface of said bearing carrier for retention of lubricant and the distribution thereof during axial shifting of the bearing assembly, said lubricant retention means including a circumferentially extending groove of a depth less than (the thickness of said sheet metal) and extending in a plane perpendicular to the longitudinal axis of said bearing, and

bearing retention means for locating and securing said bearing on the carrier comprising at least one protrusion protruding from the outer circumferential surface of the carrier, said bearing being press fittingly mounted on the outer circumferential surface of said carrier and abutting against said at least one protrusion at one end of one of said race members, and said carrier being staked at the end therof opposite said radial flange into abutting engagement with the other end of said one of said race members.

4,117,918
WEDGING CENTRIFUGAL CLUTCH WITH TORQUE LIMITER

Russell Earl Silberschlag, Glen Ellyn, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 28, 1976, Ser. No. 754,935
Int. Cl.[2] F16D *43/14*
U.S. Cl. 192—103 B 5 Claims

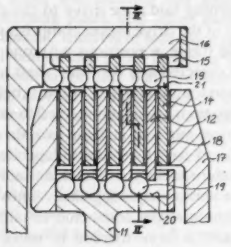


1. An engaging mechanism comprising, first and second relatively rotatable members, an annular disc fixed to said first member, a plurality of shoe assemblies mounted in said disc, cam means on said disc, said assemblies including means in engagement with said cam means, said assemblies having a frictional surface thereon, centrifugal force acting to urge said assemblies into engagement with said second member at a given speed of rotation, said assemblies moving along said cam means after initial engagement whereby said devices are wedged between said disc and said second member to self-energize and increase the torque capacity of the clutch, torque limiting means associated with said cam and assemblies operating to limit the torque capacity of the clutch developed by said self-energizing feature, said assemblies include roller mechanisms engaging the cam and said torque limiting means includes spring means mounting said rollers wherein said torque limiting means comprises a flexible arm on said shoe assembly mounting said roller mechanism, said arm flexing when the predetermined torque capacity is exceeded.

4,117,919
CENTRIFUGAL DISK SEPARATION DEVICE FOR A DISK CLUTCH

Ludwig Rupp, Ravensburg, and Hubert Mayer, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Jan. 11, 1977, Ser. No. 758,429
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1976, 2601507
Int. Cl.[2] F16D *13/69*
U.S. Cl. 192—103 A 12 Claims



1. Apparatus for forcing and holding apart the disks of a disengaged disk clutch of the type having disk supports with disks rotatably fixed thereto and axially movable thereon, said apparatus comprising:

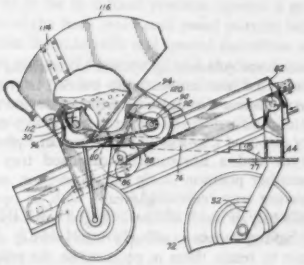
a plurality of separately movable axially spaced centrifugal weight means, at least two of said weight means disposed between adjacent like disks during both a clutch engaged position and a clutch disengaged position;

and means for guiding said weight means to move by centrifugal force acting thereon to force the like disks apart by a predetermined amount when said disks are in the clutch disengaged position.

4,117,920
AUGER HOPPER

Robert F. Oury, Elmhurst, Ill., assignor to Rotec Industries, Elmhurst, Ill.

Filed Mar. 2, 1977, Ser. No. 773,550
Int. Cl.[2] B65G *47/18*
U.S. Cl. 198—311 10 Claims



1. An auger hopper for delivering cementious material from a supply source to a conveyor, comprising, in combination:

an elongated hopper having an input portion and a discharge portion, the discharge portion being narrower than the input portion and including first and second end walls, said end walls having first and second channels defined therein;

a discharge opening defined in the delivery portion of the hopper and being substantially shorter than the elongate hopper;

an auger having a shaft with first and second end sections and a screw blade thereon locatable in the narrow discharge portion of the hopper with the first section of the auger shaft having a sprocketed wheel connected thereto and located outside of the hopper adjacent the first end wall;

a sprocketed drive shaft rotatably mounted on the hopper having an axis of rotation fixed with respect to translational movement in relation to the hopper side wall;

first and second arms disposed adjacent the outer portions of the first and second end walls respectively and pivotably connected to the hopper for rotation about the axis of rotation of the sprocketed drive shaft;

first and second bearing members on the first and second arms adapted to receive the first and second end sections of the auger shaft extending through the first and second longitudinal channels;

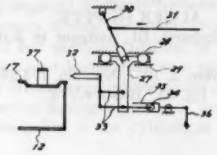
drive chain means drivably connecting the sprocketed wheel on the auger shaft with the sprocketed drive shaft;

whereby the auger may be rotated to drive cementious material toward the discharge opening and the auger may translate away from the narrow discharge portion of the hopper toward the wider input portion of the hopper when a hard lump tends to be lodged between the auger screw blade and the hopper to permit rotation of the hopper with a minimum of jamming and whereby the drive chain may be kept at a fixed tension and not pulled or loosened when the auger is translated during operation.

4,117,921
TRAY LOADING DEVICE IN CONTINUOUS CONVEYING AND PROCESSING SYSTEM

Yoshitaka Mikata, Himeji, Japan, assignor to Yamato Scale Company, Ltd., Japan

Filed Feb. 7, 1977, Ser. No. 766,529
Claims priority, application Japan, Feb. 10, 1976, 51/14224[U]
Int. Cl.[2] B65G *47/02, 47/34*
U.S. Cl. 198—482 2 Claims

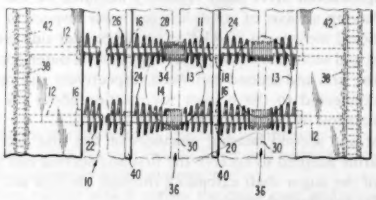


1. A continuous processing system comprising a material treating device for treating materials carried in trays, an endless conveyor passing through said treating device and having a plurality of uniformly spaced tray receiving carriages, a horizontally disposed tray loading station at one position along said conveyor and a horizontally disposed tray unloading station at another position along said conveyor, each of said carriages having tray receiving means with an open side for reception of a tray or stack of interengaged trays and an elevatable cover having means positively interlocking said tray or stack of trays to retain them in position on the tray receiving means during movement by said endless conveyor, means for intermittently driving said conveyor and causing said carriages to pause at the loading and unloading stations, means at said loading station for raising said elevatable cover while maintaining it in a horizontal position, loading said tray or stack of trays onto said carriage and lowering said cover while maintaining in said horizontal positon to engage said tray or stack of trays during the pause in said motion and means at said unloading station for elevating said cover while maintaining it in a horizontal position and removing said trays.

4,117,922
COILED SPRING CONVEYOR FOR EGGS

Thomas O. Niederer, Titusville, N.J., assignor to Otto Niederer Sons, Inc., Pennington, N.J.

Filed Mar. 7, 1977, Ser. No. 775,028
Int. Cl.[2] B65G *39/06, 39/20*
U.S. Cl. 198—652 7 Claims

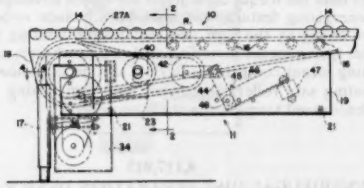


1. An improved coiled spring conveyor for eggs comprising:
(a) a plurality of parallel rods extending transversely with respect to the direction of movement of the conveyor;
(b) a plurality of coiled springs positioned about said rods concentrically to define a plurality of egg receiving receses between pairs of said coiled springs positioned about adjacent rods, each of said coiled springs further including:
(1) a plurality of first spring sections having a generally cylindrical configuration, said first spring sections having an internal coil diameter slightly larger than the outside diameter of said rods to facilitate gripping of said rods by said coiled springs when positioned thereareound; and
(2) a plurality of second spring sections having a coil diameter larger than the coil diameter of said first spring sections, said second spring sections having a generally cylindrical configuration with a slightly concave outer surface to cooperate with other second spring sections of adjacent coiled springs to define egg receiving recesses therebetween, said second spring sections including an opaque section in the approximate center thereof for preventing the passage of light therethrough during candling, said opaque section being formed by abutment between adjacent turns of said coiled spring within said second spring section, said opaque section having an internal diameter greater than the internal diameter of said first section and greater than the outside diameter of said rod.

4,117,923
DRIVE MEANS FOR ROLLER CONVEYORS

Charles W. Werntz, Ferguson, Mo., assignor to Alvey Inc., St. Louis, Mo.

Filed May 31, 1977, Ser. No. 801,535
Int. Cl.[2] B65G *13/07*
U.S. Cl. 198—790 2 Claims

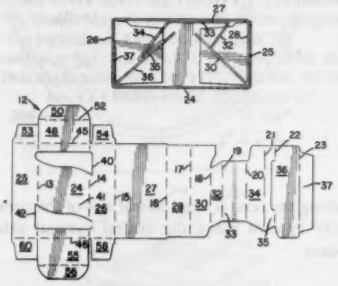


1. In an article conveying live roller conveyor having a frame with spaced rails defining a conveying path, a plurality of article supporting rollers operatively carried by said rails, snubbing roller means carried by said rails adjacent said article supporting rollers, an endless rope drive member supported by said snubbing roller means in position to engage and rotate said article supporting rollers, and power operated drive means for pulling said rope drive in a direction for rotating said article supporting rollers to transport articles supported thereon, said drive means returning said rope drive to the conveying path, the improvement of the drive means comprising a pair of shafts supported by said frame in positions with one shaft having its axis horizontally directed and the other shaft having its axis at an angle to the horizontal, said pair of shafts being otherwise in parallel spaced relation, a drum connected to said one shaft and having a cylindrical surface, at least two sheaves carried by said other shaft and free to rotate independently thereon, a further sheave independently rotatable on said one shaft adjacent said drum, a tension adjusting sheave movably carried by said frame, a counterweight connected to said tension adjusting sheave to exert a force thereon to move the same, said endless rope drive member being trained about said drum surface and said independently rotatable sheaves such that said rope drive member tracks on said drum surface in a plurality of adjacent wraps, said rope drive member finally leaving said drum surface engaging with said movable sheave for tension adjustment by said counterweight and engaging said further sheave before returning to rotate said article supporting rollers, said further sheave being engaged by said rope drive member for directing it in its returning direction to rotate said article supporting rollers.

4,117,924
DISPLAY CARTON

Lawrence J. Growney, Pearl River, N.Y., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Jun. 20, 1977, Ser. No. 808,436
Int. Cl.[2] B65D 5/50
U.S. Cl. 206—45.14 6 Claims



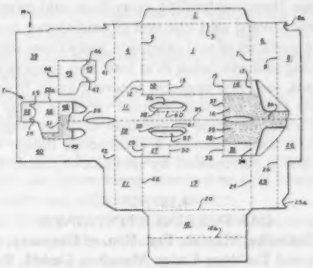
1. An elongate generally rectangular one piece carton blank of bendable sheet material which is divided by parallel, longitudinally spaced transverse score lines into a series of generally rectangular panels comprising a front wall forming panel having an opening of substantial size cut therein, adjoining sidewall forming panels, a back wall forming panel extending from one of said sidewall forming panels, and a partition and shadow forming panel structure extending from the transverse score line defining the side edge of said back wall forming panel which is remote from said front wall forming panel, which partition and shadow forming panel structure includes a sidewall reinforcing panel extending from said side edge score line of said back wall forming panel to a longitudinally spaced hinge forming score line separating said sidewall reinforcing panel from a first shadow forming panel, said reinforcing panel having a dimension in the direction longitudinally of the blank which is somewhat less than the corresponding dimension of the sidewall panel adjoining said back wall forming panel, said hinge forming score line defining one edge of a relatively narrow hinge forming panel, said hinge panel extending to a longitudinally spaced, transverse score line defining one edge of a back wall connecting panel having a dimension in the longitudinal direction of the blank which is substantially smaller than the corresponding dimension of said back wall panel, said back wall connecting panel extending to a longitudinally spaced transverse score line defining an opposite side edge of said back wall connecting panel, a shadow panel assembly extending to the end of the blank which is divided by spaced parallel hinge forming transverse score lines so as to provide a second shadow panel and a glue panel at the end margin of the blank, and said back wall connecting panel being subdivided by a hinge forming transverse score line to provide a relatively narrow strip adjoining said score line separating said back wall connecting panel from said hinge panel and spaced from the score line separating said back wall connecting panel from said last mentioned shadow panel assembly.

3. A collapsible carton formed of a one piece blank of bendable sheet material which is cut and creased to provide a plurality of hingedly connected panels which are folded and secured so that in set up condition and disposed on end said carton comprises a tubular body having a back wall, adjoining sidewalls hinged thereto, a front wall hingedly connected to forward edges of the sidewalls with one or more openings formed therein by cutting out a substantial area intermediate the top and bottom edges thereof, top and bottom closure flaps hinged to said sidewalls and to said back or front wall, and a partition and shadow panel structure disposed within said tubular body comprising a pair of shadow forming panels hingedly connected at opposite sides of a front wall opening on hinge axes substantially coinciding with the hinge axes of the connection of the front wall with the sidewalls, each of said shadow forming panels being disposed in a plane extending diagonally inwardly of the front wall opening and in the direction of the back wall and the opposite sidewall, at least a portion of the inner margin of one of said shadow forming panels being reversely folded so as to extend in the direction of the sidewall to which said shadow forming panel is connected and in the direction of the back wall, and a panel means hingedly connecting inner marginal portions of said inwardly directed shadow forming panels which panel means has a portion secured so as to lie in a fixed position against a portion of the inner face of the back wall, said panel portion being disposed intermediate the sidewalls and spaced therefrom so as to form with inner marginal portions of said shadow forming panels a forwardly open pocket of substantial width between said inner margin portions for retaining therein a generally tubular product with portions of said product visible through the front wall opening when placed in said pocket.

4,117,925
ARTICLE CARRIER AND BLANK THEREFOR

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 11, 1977, Ser. No. 823,588
Int. Cl.[2] B65D 5/48
U.S. Cl. 206—186 3 Claims



1. An article carrier comprising a bottom wall, side walls foldably joined respectively to the side edges of said bottom wall, end wall panels foldably joined respectively to the end edges of said side walls, a riser panel foldably joined respectively to the associated end wall panel at one end of the carrier and extending medially inward of the carrier, medial partition structure foldably joined to the end wall panels at the other end of the carrier and extending medially inward of the carrier, a multiple ply handle secured at one end thereof to the upwardly extending portion of said riser panel and secured at the other end thereof to the upwardly extending portion of said medial partition structure, a hand hole disposed in said handle, and transverse partition structure struck from said medial partition structure and including an anchoring tab secured to one of said side walls, a transverse partition strip foldably joined to said anchoring tab, and an inverted L-shaped medial tab having vertical and horizontal parts and with its vertical part foldably joined to said transverse partition strip remote from said anchoring tab and with its horizontal part foldably joined to said medial partition structure along a horizontal fold line, the fold line between said medial tab and said medial partition structure being substantially adjacent the lower edge

of said hand hole and being substantially coextensive therewith.

4,117,926

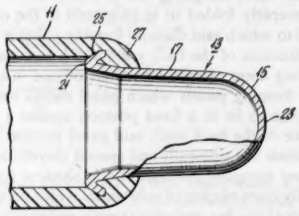
PROBE COVER

Robert Bruce Turner, Weymouth, Mass., and Glen Lee Weinberg, Berkley Heights, N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 12, 1977, Ser. No. 758,893

Int. Cl.[2] G01K *1/16*

U.S. Cl. 206—306 **4 Claims**



1. An electronic thermometer probe cover apparatus, comprising:

an elongate sleeve member having surfaces defining a hollow interior along a longitudinal axis, said sleeve member being configured generally to receive an electronic thermometer probe;

a tip member attached to and closing one end of said sleeve member, in position for thermal engagement with said probe, said tip member being generally axially symmetric about said axis, generally cup shaped at an outermost terminus, thence extending away from said terminus along said axis toward said one end of said sleeve member, the interior surfaces of said extension away from said terminus and along said axis being in at least two successive integral segments, said first segment tapering away from said axis at a first angle and said segment tapering away from said axis at a second angle larger than said first angle, said tip member thence defining a protruding flange which engages and is surrounded by said sleeve member.

4,117,927

GAS TURBINE CONTAINER

Friedrich Gothsche, Munich, Fed. Rep. of Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,929

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554685

Int. Cl.[2] B65D *85/68*

U.S. Cl. 206—319 **11 Claims**

1. A container for a gas turbine engine, comprising:

means for supporting the container;

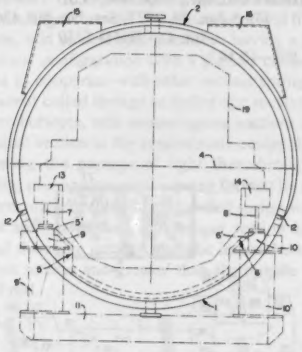
guide means arranged in the container for guidingly mounting the gas turbine engine therein;

damping means interposed between said guide means and said supporting means for damping vibration of the container;

a lower container member mounted on said damping means;

recess means arranged in the lower container member, said recess means supporting said guide means and being supported by said damping means so that all the force of the weight of the gas turbine engine is transmitted directly downward through the vertical axes of the guide means, the recess means, and the damping means, to be absorbed by the damping means; and

an upper container member joining said lower container member and having a wall arranged at least at one end thereof to define an entire end wall of the container, said upper container member being removable from the lower container member so that the gas turbine engine may be removed from the container either directly in a horizontal



line along the central longitudinal axis of the container or directly upward along the central vertical axis of the container.

4,117,928

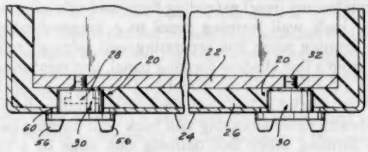
FASTENER FOR SHIPPING CONTAINER

Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co. Inc., West Islip, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,280

Int. Cl.[2] B65D *85/00;* A44B *21/00*

U.S. Cl. 206—320 **7 Claims**



1. In a shipping container of the type having a surrounding peripheral wall and a hollow interior for retaining an article therein, resilient protective insulation in the container and located between the article and at least one adjacent portion of the inner surface of the peripheral wall of the container, the improvement comprising; a quick release fastener for mounting the article in the protective shipping container and including a stud having a base portion with means thereon for mounting the stud to the article being protected and a head portion extending from the base, a receptacle having a larger diameter flange thereon for interengagement with surfaces on the shipping container and a tubular housing with a recess therein for receipt of the head of the stud therein, one of the stud and receptacle having a spiral cam slot thereon and the other of the stud and receptacle having a cam follower thereon for interengagement therebetween when the stud is mounted to the article and the receptacle is positioned on the container, the resilient protective insulation being positioned between the container and the article at least at the location of the fastener and acting as spring means to permit relative movement between the article and container toward and away from one another as

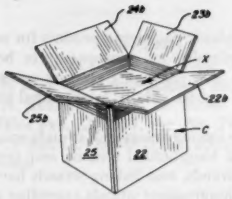
the resilient spring means is compressed and released and thus permitting the shifting of the stud and receptacle between the fastened and unfastened positions.

4,117,929

SHIPPING UNIT AND METHOD OF LOADING SAME

Donald M. VanderMey, Grand Rapids, Mich., assignor to Packaging Corporation of America, Evanston, Ill.

Continuation of Ser. No. 634,871, Nov. 24, 1975, abandoned.
This application Feb. 10, 1977, Ser. No. 767,408
Int. Cl.[2] B65D *81/02, 85/30, 25/10*
U.S. Cl. 206—326 3 Claims



1. A shipping unit comprising an upright product having a substantially flat upper surface, the peripheral configuration of which may vary over a wide range; a container formed from a blank of sheet material accommodating the product therein, said container including a plurality of side walls having adjacent side walls connected by elongated upright foldlines, the upper portion of each side wall being provided with a plurality of vertically spaced foldlines extending across the entire width of said side wall and being disposed transversely of the upright foldlines, a bottom subtending the accommodated product, and top closure flaps connected to the side walls above the vertically spaced foldlines; and spacer means overlying the product upper surface, said spacer means including a multi-sided planar base member having a continuous, uninterrupted peripheral configuration conforming substantially to the area delimited by the container side walls and having the periphery of said base member in contact with the interior surface of said side walls, the peripheral configuration of said base member being larger than the range of peripheral configurations of the upper surface of the product accommodated within the container, and a plurality of stationary retainer elements affixed to and depending from the underside of the base member and snugly engaging peripheral segments of the product upper surface, the arrangement of said retainer elements effecting positioning, adjacent to and centrally of one side of said base member, at least a portion of each retainer element being positionable between a peripheral segment of the product upper surface and an adjacent container side wall, the upper side of the base member being in substantially coplanar relation with predetermined corresponding foldlines formed in the upper portions of said side walls and disposed beneath the connection between said top closure flaps and the side walls, the portions of the adjacent side walls disposed above the predetermined corresponding fold-lines being separated from one another by cuts aligned with the upright foldlines connecting the adjacent side walls and extending only downwardly from the top closure flap connections to the predetermined corresponding foldlines, whereby said top closure flaps and the associated cut portions of the side walls are folded about the predetermined corresponding foldlines and secured in overlying top closing relation with the upper side of the base member.

4,117,930

PACKING RECEPTACLE FOR SEWING MACHINE NEEDLES

Klaus Pavel, Eynatten, Belgium, assignor to Rhein-Nadel Maschinennadel GmbH, Aachen, Fed. Rep. of Germany

Filed Aug. 4, 1977, Ser. No. 821,775
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 7710391[U]
Int. Cl.[2] B65D *85/24*
U.S. Cl. 206—382 10 Claims

1. A packing receptacle for sewing machine needles, comprising

an upper part having the shape of a flat cap and having spaced apart wide side walls defining at one end thereof an opening therebetween and gripping recesses, respectively, adjacent said opening, said side walls being off-set in part relative to each other, one of said side walls has lateral opening-sided edges on opposite sides adjacent said opening, respectively,

a stay-shaped lower part being in the form of a platelet releasably positively clampingly insertable in said opening of said upper part between said wide side walls,

said lower part being adapted to carry sewing machine needles, the latter being inserted in said lower part in a row series and adjacent one another,

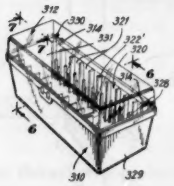
said stay-shaped lower part has a partial surface exposed by said gripping recesses, respectively, in an inserted position of said lower part in said upper part,

the other of said side walls of said upper part forms projections constituting narrow lateral tongues, a corresponding of said gripping recesses extends between the latter, said lateral tongues lying opposite to and projecting beyond said opening-sided edges of said one side wall, said one side wall being formed with a slot therein interrupting the surface of said one side wall therethrough, said slot extending to a corresponding of said gripping recesses, said other side wall having a wall section lying behind and opposite to said slot operatively constituting a central orientation abutment surface for the needles, said upper part including narrow side walls each extending perpendicularly to and connected to both of said wide side walls, said narrow side walls including lower side wall portions connected to and extending perpendicularly to said lateral tongues and said opening-sided edges, said opening-sided edges of said one side wall and said lower side wall portions forming a catch opening laterally communicating with and enlarging the corresponding of said gripping recess in said one side wall, said lateral tongues and said lower side wall portions facing said catch opening and operatively constituting lateral shoe-like orientation abutment surfaces on opposite lateral sides of the corresponding of said gripping recess for the needles.

4,117,931
CASE FOR DIFFERENTLY SIZED MAGNETIC TAPE ENCLOSURES

Joseph L. Berkman, 48 Country Rd., Mamaroneck, N.Y. 10543

Continuation-in-part of Ser. No. 561,315, Mar. 24, 1975, Pat. No. 4,003,468, and a continuation-in-part of Ser. No. 744,467, Nov. 24, 1976. This application Nov. 26, 1976, Ser. No. 745,248
The portion of the term of this patent subsequent to Jan. 18, 1994, has been disclaimed.
Int. Cl.[2] B65D *85/30, 85/62*
U.S. Cl. 206—387 15 Claims

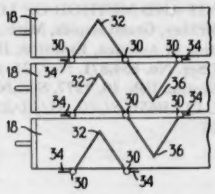


1. A case having side and end walls adapted for interchangeably receiving and storing two differently sized magnetic tape enclosures having generally rectangular configurations, the first enclosure having a smaller width and a greater thickness than the corresponding dimensions of the second enclosure, and having a height greater than the height of the second enclosure; said case having at least one row of tandem storage compartments, at least one of which is adapted to interchangeably receive a first or a second dimensioned magnetic tape enclosure, said compartment being generally rectangular in configuration and bounded on two sides by wall portions spaced from each other a first predetermined distance approximately equal to the width of the first enclosure to receive the same therebetween and a further wall portion substantially normal to said wall portions, said compartment being open on the side thereof opposite said further wall portion for receiving the enclosures; and guide means at least partially bounding said wall portions of said compartment to define a space having a thickness equal to a second predetermined distance approximately equal to the thickness of the first enclosure for guiding the first enclosure into said compartment and preventing the first enclosure from moving therein, wall means spaced from said wall portions and cooperating therewith to form an elongate rectangular recess which opens at said compartment open end and is spaced from said further wall portion so as to form a depth limiting shoulder or ledge adapted to maintain at least a portion of said second enclosure projecting above said wall portions upon full insertion of said second enclosure into said compartment, each recess forming retaining wall portions which define a space having a width greater than said first predetermined distance and a thickness smaller than said second predetermined distance suitable for securely receiving a second enclosure to thereby prevent movements of a second enclosure within said compartment, whereby the manual gripping of any second enclosure is facilitated by said depth limiting shoulder, and whereby said compartment can interchangeably receive either a first or a second enclosure and maintain either enclosure securely therein by insertion through an associated compartment open end and respective cooperation with either said guide means or said retaining wall portions of said recess.

4,117,932
PLASTIC PACKAGING PRODUCT FOR SEPARATION OF COMPONENTS

Ronald L. Larsen, Minneapolis, Minn., and Clifford W. Berry, Marlton, N.J., assignors to Conwed Corporation, St. Paul, Minn.

Continuation of Ser. No. 748,635, Dec. 8, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 862,181
Int. Cl.[2] B65D *85/42*
U.S. Cl. 206—419 6 Claims



1. An extended plastic packaging product for separation and cushioning of a plurality of components in horizontal and vertical directions, said packaging product comprising:

(a) a plurality of spaced, parallel longitudinal strands lying in a first plane;

(b) at least three linking transverse strands spaced along the length of said longitudinal strands and connecting said longitudinal strands, said linking strands having a portion between said longitudinal strands extending at least ¼ inch into a second plane;

(c) said longitudinal and linking strands being extruded as an integral plastic structure;

(d) said linking strands being or smaller cross-sectional dimension than said longitudinal strands and being flexible and said longitudinal strands being more rigid than said linking strands;

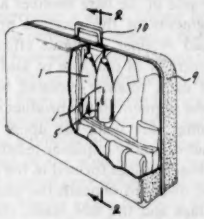
(e) the adjacent linking strands being spaced to accommodate only one of said components and separate it from adjacent components lying in the same horizontal plane; and

(f) the longitudinal strands being arranged to support one layer of said components in a first horizontal plane and to separate said first layer from an adjacent layer of said components in a parallel horizontal plane.

4,117,933
BOTTLE CARRIER

Gilles Lachance, 56 Place Montmorency, Laval, Canada (H7N 1T6)

Filed Aug. 30, 1977, Ser. No. 829,585
Int. Cl.[2] B65D *85/54*
U.S. Cl. 206—583 3 Claims



1. The combination of a bottle carrier with a suitcase, the latter having a generally rectangular or squared shape body portion defined by a bottom wall and pairs of substantially parallel first and second side walls, with said second side walls being substantially perpendicular to said first side walls, a

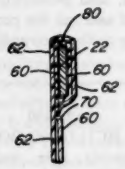
cover hinged to said body portion along an edge of one of said first side walls, a carrying handle for said suitcase attached to the other of said first side walls, said bottle carrier comprising an elongated generally bottle-shaped wrapper sheath of a material having heat-insulating and shock-protecting properties and having an opening for removal and insertion of a bottle, means for closing said opening, and a shock-absorber resilient attaching means for said wrapper sheath including a helical spring attached at one end to an end of said wrapper sheath, and at the other end to said other one of said first side walls, and a cord attached to the other end of said wrapper sheath and to said one of said first side walls, said wrapper sheath, spring and cord extending along a substantially straight line within said suitcase and in a plane substantially parallel to said cover and bottom wall and extending through said handle, said cord maintained taut by said spring, whereby a bottle inserted in said wrapper sheath may be carried upright inside said suitcase when the latter is upright and said handle uppermost, and is further protected by garments and other items carried in said suitcase and filling the latter around said wrapper sheath and bottle.

4,117,934

RECLOSABLE BAG

John C. Mowli, 2032 W. Jarvis, Chicago, Ill. 60645, and Harry Bala, 2259 N. Kedzie, Chicago, Ill. 60647

Filed Feb. 22, 1977, Ser. No. 770,603
Int. Cl.[2] B65D *27/34, 33/30*
U.S. Cl. 206—610 **1 Claim**



1. A plastic bag formed of heat sealable film-type material and including a front wall, a back wall and closed bottom and side edges, the improvement comprising, in combination: a stiffener strip capable of being bent manually and retaining the bent shape; the front wall and the back wall being folded over said stiffener strip and being heat sealed to the front wall whereby the stiffener strip is intermediate four plies formed from the front wall and the back wall; said heat sealed walls forming a pocket for said stiffener strip; and a bag mouth portion located intermediate said stiffener strip and said closed bottom, said bag mouth portion comprising a score line capable of being easily severed by manual manipulation.

4,117,935

APPARATUS FOR AND METHOD OF MEASURING PRODUCT MASS

Carl Richardson, Bedford; Hugh F. Stoddart, Groton, and Philip A. Wiley, Boxboro, all of Mass., assignors to Bedford Engineering Corp., Bedford, Mass.

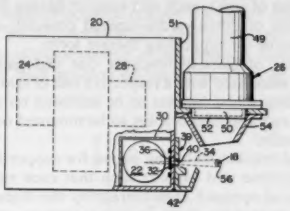
Filed Jun. 9, 1976, Ser. No. 694,240
Int. Cl.[2] B07C *5/16, 5/344*
U.S. Cl. 209—586 **24 Claims**

1. A system for classifying products according to their mass, said system comprising in combination;

means for conveying products along a predetermined path through an inspection station;

irradiating means for directing a beam of low energy penetrating radiation transversely to said path so that the entire bulk of each product conveyed through said station is substantially instantaneously exposed to said beam of radiation;

detector means for receiving radiation scattered by the entire bulk of each product irradiated by said beam and generating an electrical signal representative of the amount of scattered radiation received by said detector means; and



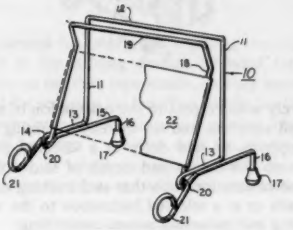
means coupled to said detector means for determining the mass of each product irradiated by said beam as a function of said electrical signal.

4,117,936

WIRE RACK

Robert L. Dawson, San Diego, Calif., assignor to Prima International, San Diego, Calif.

Filed Oct. 31, 1977, Ser. No. 847,078
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—50 **7 Claims**



1. A wire rack for supporting magazines, and the like comprising: a first wire-formed frame having an essentially U-shaped configuration and having lower article-carrying end portions extending forwardly of the plane of the frame and having a further lower end portion extending rearwardly of the plane of the frame to constitute rear legs for the rack; and a second wire-formed frame having an essentially U-shaped configuration hinged to the first frame in facing relationship therewith, said second wire-formed frame having lower end portions extending forwardly of the plane of the second frame to constitute front legs for the rack, whereby articles supported on the article-carrying portions of the first frame cause the first and second frames to turn angularly toward one another to exert a clamping action on such articles.

4,117,937

ASSEMBLY FOR HOUSING, CONVEYING AND BRINGING-FORTH TOOLS DURING THE OPERATION OF NUMERICALLY CONTROLLED MACHINES

Mario Ratti, Bresso (Milan), Italy, assignor to S.U.S.T.A. S.p.A., Milan, Italy

Filed Nov. 8, 1976, Ser. No. 740,241
Claims priority, application Italy, Nov. 10, 1975, 22639 A/75
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—60 T **7 Claims**

1. An assembly for use in supporting and conveying a plurality of tools, said assembly comprising:

a conveyable dolly including a base and a pair of parallel spaced walls extending substantially vertically upwardly

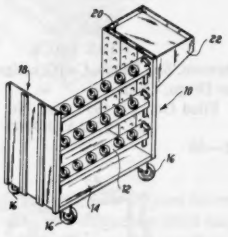
from said base, said walls extending vertically to define the height of said dolly and horizontally to define the depth of said dolly;

a plurality of tool supports dimensioned to extend between said pair of walls, each said support having fixed thereto a plurality of downwardly-tapered conically-shaped bushing means for supporting therein tools;

a plurality of pairs of brackets, one said pair of brackets being associated with a respective one of said supports and including a first bracket to be mounted on a first of said walls and a second bracket to be mounted on a second of said walls;

each said bracket including means for supporting an end of a respective said support such that each support is supported at opposite ends thereof by the respective pair of brackets at a fixed orientation to said respective pair of brackets; and

means for attaching each said pair of brackets to said walls at a selected fixed position of a plurality of positions varying horizontally and vertically with respect to said walls and



rotatively with respect to the orientation of said brackets and said supports, and for thereby mounting said respective supports to said dolly at a selected position with respect to the height and depth of said dolly and at a selected orientation such that said bushing means extend vertically or at a selected inclination to the vertical, said attaching and mounting means comprising:

a plurality of openings in each said wall, said openings in each said wall being spaced from each other both horizontally and vertically of said wall, the openings in said pair of walls being aligned;

a first hole in each said bracket, and a plurality of second holes in each said bracket, each of said second holes being spaced an equal distance from said first hole; and

first and second bolt means associated with each said bracket, said first bolt means extending through said first hole of said bracket and a first selected said opening of the respective wall, and said second bolt means extending through a selected of said second holes of said bracket and a second selected opening of said respective wall.

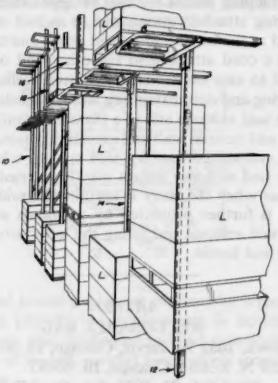
4,117,938

PROTECTOR ARM

Herbert H. Klein, Arlington Heights, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Jul. 22, 1976, Ser. No. 707,686
Int. Cl.[2] A47F *5/00*
U.S. Cl. 211—191 **7 Claims**

1. A rack for use in storing loaded pallets which includes a plurality of vertical rack frames which are spaced apart so as to define a pallet-storage row between adjacent rack frames, each of said rack frames including a plurality of vertical posts, brace means interconnecting said posts, pallet-rail support means mounted to said posts, and a plurality of horizontal pallet-receiving rails supported by and mounted on said support means, said rails being constructed to receive and support loaded pallets wherein the improvement comprises: said rack frames having a front post positioned rearwardly of the front end of said pallet-rail so that a portion of said pallet-rail extends forwardly of the front post with the distance between the front post and forward end of said pallet rail being effective to permit stacking of loaded pallets on either side of said post and to extend forwardly of said front post and so as to protect said front post, and to provide a rack having the capability of providing greater turn-in clearance into a pallet row, and in



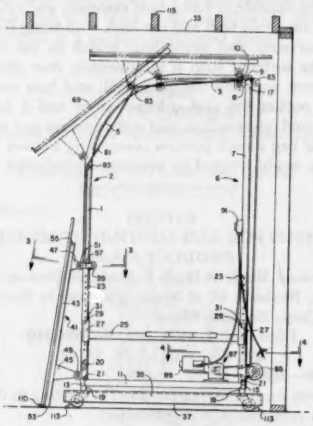
combination therewith, protector arm assembly means for mounting on the front post beneath and adjacent said forwardly-extending pallet-rail, said protector arm assembly means extending forwardly of said rail for providing protection and minimizing injuries due to the forwardly-extending portion of said pallet-rail.

4,117,939

MOVEABLE BUILDING BOARD HOIST

Elvin D. Haddock, Phoenix, Ariz., assignor to Yuma Desert Manufacturing, Inc., Yuma, Ariz.

Filed Jan. 2, 1975, Ser. No. 537,864
Int. Cl.[2] B66F *9/12*
U.S. Cl. 214—1 SW **7 Claims**



1. A moveable building board hoist comprising a track having a vertically disposed leg having a lower end, a horizontally disposed leg having an upper end, a curved knee connecting said legs, support means for supporting said track, means for adjusting the height of said track to working proximity, and motive means for moving and carrying building board from and between said ends comprising a truck having a receiver for the board which carries the board at an angle to the track, the

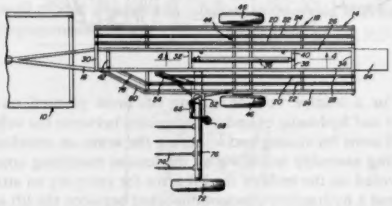
lower end of the board when in the vertically inclined position being more distant from the track than the upper end such that the board is substantially parallel to the plane in which the board is to be permanently affixed when the truck is moved to said horizontally disposed leg of said track, said motive means cooperating with the angle of inclination and height of said track to place said board in working proximity to a horizontally disposed structure to which the board is intended to be affixed when the board is raised to said horizontally disposed leg of said track.

4,117,940

SIDE LOADING-REAR DISCHARGING TRAILER FOR MULTIPLE ROUND BALES

Robert G. Adam, Okeene, Okla. 73763

Filed Mar. 29, 1977, Ser. No. 782,439
Int. Cl.[2] B60P *1/48*
U.S. Cl. 214—1 HH **12 Claims**



1. In combination, an elongated horizontal frame for receiving hay bundles thereon, said frame including ground engageable support structure for support of said frame from the ground and longitudinal advancement of said frame thereover, an elongated generally horizontal arm, support means supporting one end portion of said arm from said frame for horizontal swinging of the other end of said arm about an upstanding axis relative to said frame between a first position with said arm projecting outwardly from one side of said frame and a second position with said arm closely paralleling said frame with a first side of said arm opposing said frame, hay bundle engaging means supported from the other end portion of said arm and projecting outwardly from said first side thereof, at least the outer portion of said hay bundle engaging means being adapted to supportively engage a ground supported hay bundle toward which said one side of said arm is laterally advanced into close proximity with said hay bundle, elevating means supporting said hay bundle engaging means from said arm for up and down movement of at least the outer portion of said hay bale engaging means relative to said arm, said frame, at a point spaced along said one side thereof from said axis a distance substantially equal to the spacing of said hay bundle engaging means along said arm from said axis, being structured to receive thereon a hay bundle supported from said hay bundle engaging means outer portion when the latter is in an elevated position and said arm is swung from said first position to said second position.

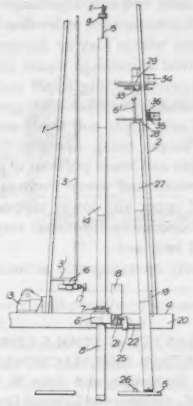
4,117,941

DEVICE FOR HANDLING AND RACKING RISER PIPES AND DRILL PIPES

Robert W. McCleskey, Jr.; Paul S. Putnam, and Arne Martin Boltad, all of Oslo, Norway, assignors to Golar-Nor Offshore A/S, Oslo, Norway

Filed Mar. 25, 1977, Ser. No. 781,482
Claims priority, application Norway, Apr. 1, 1976, 761124
Int. Cl.[2] E21B *19/14*
U.S. Cl. 214—2.5 **13 Claims**

1. Device for handling and racking riser pipes in a driling derrick on a platform for drilling and/or production of oil wells on the bottom of the sea, said platform/drilling derrick comprising a drill floor and a cellar deck, characterized in that said device comprises a set back platform on the cellar deck for vertical racking of riser pipe stands in the drilling derrick, a first manipulator for displacement of a riser pipe stand's lower end between a first position near the centre line of the drilling derrick and another position outside the center line, a second manipulator for displacement of a riser pipe stand's lower end between the aforementioned other position and a position above the set back position on the cellar deck, an elevator in



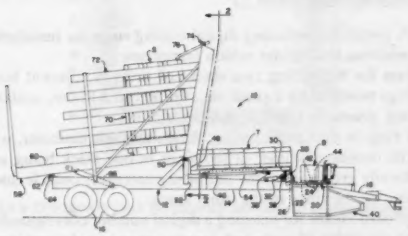
the drilling derrick for raising and lowering riser pipe stands, a finger-board in the drilling derrick intended for taking up handling subs on the riser pipe stands, locking members on the finger-board for securing the handling subs in the finger-board, a third manipulator for guiding and moving respectively a handling sub between a position near the centre line of the drilling derrick, in which position the handling sub can be coupled with the elevator, and a set back position in the finger-board.

4,117,942

MEANS FOR ADJUSTING THE SIDEBOARD

James A. Olsen, Fresno; Gene R. Butler, Kingsburg, both of Calif., and George L. Sesser, Walla Walla, Wash., assignors to Sperry Rand Corporation, New Holland, Pa.

Continuation of Ser. No. 717,413, Aug. 24, 1976. This application Nov. 2, 1977, Ser. No. 847,977
Int. Cl.[2] B65G *59/08*
U.S. Cl. 214—6 B **10 Claims**



1. In a bale wagon having a load bed being adapted to receive successive tiers of bales at one end thereof and accumulate said tiers to form a stack thereon and means for stabilizing said stack on said load bed, said stabilizing means including sideboard structure extending along each of the opposite sides of said load bed for laterally supporting said stack, upstanding members supporting said respective sideboard structures, lower means supporting said upstanding members adjacent the

lower ends thereof and mounting at least one of said upstanding members for transverse movement toward and away from said load bed and upper means extending between and supporting the upper ends of said upstanding members, said upper supporting means mounting at least said one of said upstanding members for transverse movement toward and away from said load bed, improved adjustment means for selectively moving at least said one of said upstanding members and thereby said sideboard structure supported thereon toward and away from said corresponding load bed side to change the spacing between said sideboard structures in order that the formation of stacks having different widths may be accommodated on said load bed, said improved adjustment means comprising:

actuating means interconnecting upper and lower portions of said one upstanding member with respective adjacent end portions of said upper and lower supporting means, said actuating means being operable for concurrently moving said upper and lower portions of said one upstanding member toward and away from said adjacent end portions of said upper and lower supporting means and thereby toward and away from said respective adjacent side of said load bed; and

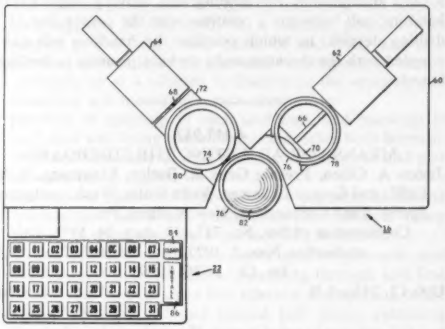
means for selectively operating said actuating means.

4,117,943

DEVICE FOR PRE-SETTING TOOLS FOR NUMERICAL CONTROLLED MACHINE

Charles L. Holland, Escondido, and John N. Coulson, Jr., El Cajon, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Oct. 4, 1976, Ser. No. 729,517
Int. Cl.[2] B65G *57/00, 59/00*
U.S. Cl. 214—6 D **1 Claim**



1. A system for selecting digital coding rings for installation of a machine tool holder which comprises:

means for supporting two stacks of rings in adjacent housings mounted on a platform adjacent to a lower, upstanding, generally conical member;

the rings in each stack having the same inside diameter, with the outside diameter of the rings in one stack being uniformly greater than the uniformly narrower outside diameter of the rings in the other stack;

keyboard means for entering a digital number corresponding to the order of wide and narrow rings in a desired stack;

electronic circuit means for converting said number to a sequence of electrical pulses; and

electrically actuated pusher means at the bottom of said stacks adapted to move the bottom rings from said stacks to said member in an order determined by the pulse sequence received at each pusher means;

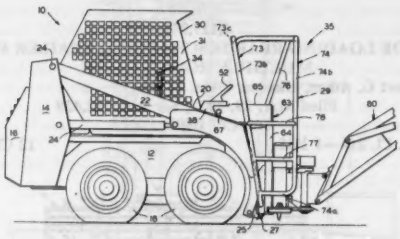
whereby a stack of rings is produced on said member having a pattern of wide and narrow rings corresponding to said number.

4,117,944

BACKHOE MOUNTING ASSEMBLY

Harold K. Beckstrom; James J. Bauer, both of Lisbon; James O. Morehouse, Havana, and Orlan J. Loraas, Lisbon, all of N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Apr. 22, 1977, Ser. No. 789,892
Int. Cl.[2] E02F *3/72*
U.S. Cl. 214—131 A **10 Claims**



1. For a tractor vehicle having lift arms pivoted on the vehicle and hydraulic cylinders connected between the vehicle and lift arms for raising and lowering the arms, an attachment mounting assembly including an implement mounting apparatus pivoted on the ends of the lift arms for carrying an attachment and a hydraulic cylinder connected between the lift arms and the implement carrying apparatus for pivoting the apparatus relative to the lift arms, the attachment mounting assembly comprising a mounting frame operatively connected to the vehicle at upper and lower mounting points at a rear end thereof and operatively connected to an implement at upper and lower mounting points at a front end thereof, the connection between the mounting frame and the vehicle comprising a mounting bracket including a member having a base portion and a step portion, the latter overlying a lateral outward projection of a front body portion of the vehicle, a pair of spaced leg portions mounted on the step portion and extending upwardly from the lateral projection of the body portion, the spaced leg portions of the mounting bracket being secured together by an upper and a lower mounting pin, the upper mounting pin pivotally receiving a locking member pivotally supported by the upper pin, and biasing means disposed between the lower pin and the locking member to bias the locking member to a lower or closed position, the mounting bracket mounted on a forward body portion of the vehicle and engaging the upper mounting point on the mounting frame and the implement carrying apparatus engaging the lower mounting point on the mounting frame to secure the mounting frame and the vehicle in operative relationship.

4,117,945

CHILD-RESISTANT SAFETY CLOSURE

George V. Mumford, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 29, 1977, Ser. No. 811,411
Int. Cl.[2] B65D *55/02, 85/56;* **A61J** *1/00*
U.S. Cl. 215—216 **27 Claims**

1. A child-resistant safety closure adapted for threadable attachment on a container having a generally cylindrical hollow dispensing end including an exteriorly threaded neck portion, an annular rim defining a dispensing opening, and an interlocking member orientationally arranged to interlock said closure on said dispensing end when said closure is threadably advanced to a fully closed position on said neck portion, said closure comprising:

a closed endwall provided with sealing means on the underside surface thereof arranged to seal said dispensing opening in fluid-tight sealed relationship,

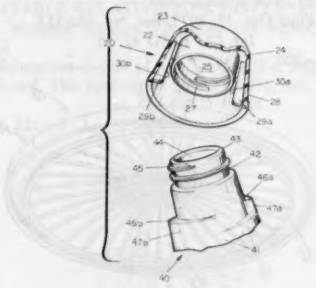
a pair of annular inner and outer sidewalls depending inte-

grally from said closed endwall in radially interspaced relationship,

said outer sidewall having a distal end portion projecting axially beyond said inner sidewall and defining a generally circular cross-sectional configuration, said distal end portion being sufficiently flexible to deform from said generally circular cross-sectional configuration to a generally elliptical cross-sectional configuration in response to manual compression of diametrically opposite sides thereof and being sufficiently resilient to essentially resume said generally circular cross-sectional configuration promptly upon release of said manual compression,

said inner sidewall defining a threaded interior surface portion threadably engageable with the threaded neck portion of said container to accommodate threaded advancement of said closure on said neck portion to said fully closed position in which said sealing means is adapted to assume fluid-tight sealing relationship with said dispensing opening;

an interlocking member integrally formed on the outer sidewall of said closure and adapted to override interlocking engagement with the interlocking member on said con-



tainer in response to normal threaded advancement of said closure on said neck portion, but to intercept the latter interlocking member in interlocking engagement in response to normal threaded retrogressive movement of said closure on said neck portion, and said interlocking engagement being releasable in response to manual compression and concurrent threaded retrogressive movement applied to said outer sidewall of said closure; and

said interlocking member on said closure being arranged to interlock with said interlocking member on said container at sequential interlocking locations orientationally related respectively to at least two separate threadably engaged positions of said closure on said neck portion, one of said interlocking locations being arranged to correspond to said fully closed position of said closure and another of said interlocking locations being disposed to substantially precede arrival of said closure in said fully closed position, whereby manual compression coupled with concurrent threaded retrogressive movement customarily must be repetitiously and premeditatively applied to said outer sidewall of said closure at peripheral locations straddling the interlocking locations in order to threadably remove said closure from said neck portion.

4,117,946

PLASTIC CAP FOR WIDEMOUTHED CONTAINERS

Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512

Filed Nov. 15, 1976, Ser. No. 742,128

Int. Cl.[2] B65D *41/18*

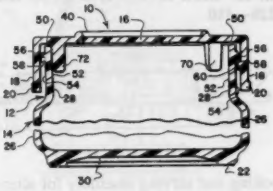
U.S. Cl. 215—321 **32 Claims**

1. A plastic cap for closing a container neck opening, comprising:

(a) a closure wall adapted to be positioned across a container neck opening;

(b) inner and outer formation means formed integrally with the closure wall and projecting from spaced portions thereof for respectively overlying inner and outer surface portions of the container neck when the cap is in place on the container neck with the closure wall positioned across the container neck opening;

(c) one of the inner and outer formation means having laterally extending projection means formed integrally therewith and projecting toward a selected container neck portion when the cap is in place on the container neck



with the closure wall positioned across the container neck opening; and,

(d) the other of the inner and outer formations means including a plurality of individual formations configured to engage the container neck at distinct spaced locations around the periphery of the container neck opening and to bias the selected container neck portion toward and into firm engagement with the projection means when the cap is in place on the container neck with the closure wall positioned across the container neck opening, whereby the engagement established between the projection means and the selected container neck portion assists in firmly releasably retaining the cap on the container neck.

4,117,947

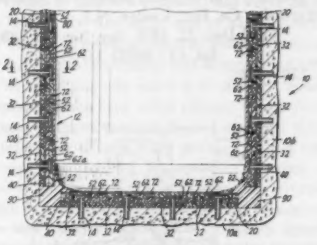
INTERNAL INSULATION FOR LIQUEFIED GAS TANK

John G. Androulakis, East Patchogue, N.Y., assignor to Frigitemp Corporation, New York, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,853

Int. Cl.[2] B65D *25/18;* B32B *7/08;* E04B *1/98*

U.S. Cl. 220—435 **14 Claims**



6. In a cryogenic tank an interior insulation system comprising:

(i) a first barrier impervious to water vapor and cryogenic fluid joined to the inner surface of the wall of said tank;

(ii) a first layer of insulation in contact with said barrier;

(iii) a second and third layer of insulation, said second and third layers being bonded together;

(iv) a fiberglass blanket interposed between said first and second layers of insulation said fiberglass blanket permitting independent relative movement between said first and second layers;

(v) a second barrier impervious to water vapor and cryogenic fluid covering the free surface of said third layer; and

(vi) anchor means extending from said wall through said first and second layers for securing said system to the tank.

4,117,948

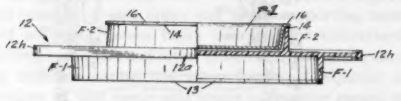
INSULATED SERVER WITH COOPERATING PANS

Harry F. Collins, Golden Valley, Minn., assignor to Service Ideas, Inc., Minneapolis, Minn.

Continuation of Ser. No. 733,186, Oct. 18, 1976, abandoned. This application Sep. 15, 1977, Ser. No. 833,520

Int. Cl.[2] B65D *25/00*; A47J *41/00*; B65D *21/02*

U.S. Cl. 220—410 **2 Claims**



1. A cooking and serving assembly for alternatively cooking and serving two different quantities of food materials and for sustaining heat in the food materials while the same are being served and eaten, having in combination:

a tray body constructed of heat-insulation material in the form of an invertible, generally horizontal deck having a generally annular insulating and receiving flange protruding from one main surface of said deck and having a second, generally annular insulating flange protruding from the opposite surface of said deck, said second flange being of substantially larger area-dimension than said first flange and both of said flanges having their outward edges lying in planes disposed parallel with the common medial plane of said deck,

a pair of heat-transmissive metal cooking pans, each being complemental in shape to one of said flanges and of somewhat smaller external peripheral dimension than the related insulating flange for respectively nesting and supporting the respective pan in its associated flange,

and in use the flange which is not employed for nesting its related pan extending downward for support and insulation of said deck body from a horizontal surface.

4,117,949

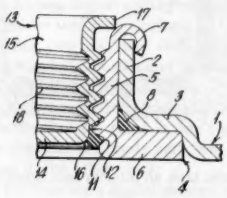
THREADED CLOSURE

Davis B. Dwinell, Warren, N.J., assignor to American Flange & Manufacturing Co. Inc., Linden, N.J.

Filed Dec. 22, 1975, Ser. No. 643,488

Int. Cl.[2] B65D *53/00*

U.S. Cl. 220—304 **1 Claim**



1. Container closure construction comprising a closure receiving member having a cylindrical neck defining a fluid passageway with a dispensing opening at the uppermost end thereof adapted to communicate with the exterior of a container, means formed at the upper end of said neck for securing said closure receiving member about a container wall opening, a first screw thread formation adjacent said means extending along the entire length of said neck, an unthreaded annular resilient sealing gasket formed in situ on the exposed surface of said neck thread in a relatively narrow zone, said gasket completely filling the thread portion located at said narrow zone and protruding radially inwardly of the thread crest and root of said thread portion into said fluid passageway, said narrow zone being located at a position on a lower portion of said neck remote from said dispensing opening, a closure member having an end wall surrounded by a cylindrical sidewall extending upwardly from said wall, said sidewall having a second screw thread formation in direct surface to surface threaded engagement with said neck, an annular gasket engaging surface on said closure member at the juncture of said end wall and said sidewall below said second screw thread formation in sealing contact with said sealing gasket so as to protect the threads of said sealing engagement located above said sealing gasket from exposure to the product to be stored in the container, and means at the upper end of said neck cooperating with means on said sidewall for limiting the axial extent of said threaded engagement at said point of sealing contact.

4,117,950

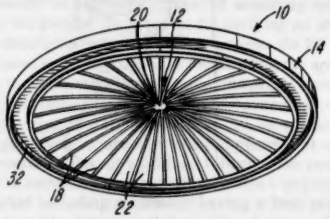
PLASTIC CLOSURE

David O. Allen, Wilmington, Ohio, assignor to Buckeye Molding Company, New Vienna, Ohio

Filed Oct. 19, 1977, Ser. No. 843,513

Int. Cl.[2] B65D *41/16*

U.S. Cl. 220—306 **6 Claims**



1. In a one piece molded plastic closure of the type having a center panel and a rim, the improvement wherein said center panel comprises a body having ribs projecting from a surface of said body and thin walled panel sections between said ribs, said ribs and said rim being formed from molten plastic flowing in the length direction of said ribs, and said panel sections being formed from plastic flowing from said ribs in directions other than said length directions.

4,117,951

AEROSOL DISPENSER LINER

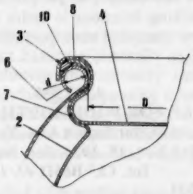
Richard Winckler, Ville D'Avray, France, assignor to Cebal, Paris, France

Division of Ser. No. 684,260, May 7, 1976, Pat. No. 4,045,860. This application Apr. 29, 1977, Ser. No. 792,197

Claims priority, application France, May 7, 1975, 75 14928; Feb. 20, 1976, 76 05316

Int. Cl.[2] B65D *25/14*

U.S. Cl. 220—461 **8 Claims**



1. An aerosol dispenser for pressurized fluids comprising a

rigid casing including a shouldered dome portion extending angularly inwardly to define a casing mouth and a mouth encircling collar, a flexible bag positioned within said casing containing the fluid to be dispensed and including a body portion whose diameter is greater than the diameter of the mouth and collar of the casing, said bag further including a neck portion terminating in an outwardly radiating flange, said flange including upper and lower substantially parallel surfaces, said flange overlying at least a portion of said collar, a seal member disposed externally of said bag between said lower surface of said flange and said collar, said seal member being out of contact with said pressurized fluid within said bag, a cap member attached to said casing by crimping deformation of at least a portion of said cap, said seal and said flange into sealing engagement with said collar, and a supply of fluid under pressure within said casing and outside said flexible bag isolated from the contents of said bag.

4,117,952

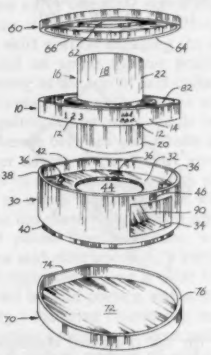
CAPSULE DISPENSER HAVING CHAMBERS ROTATABLE RELATIVE TO A DISPENSING OUTLET

Dustin Marshall Grimes, 721 N.E. 114 Street, Miami, Fla. 33161

Continuation-in-part of Ser. No. 712,004, Aug. 6, 1976, abandoned. This application Sep. 27, 1976, Ser. No. 727,165

Int. Cl.[2] **B65D** *83/04*

U.S. Cl. 221—5 **19 Claims**



1. A capsule dispenser comprising:

a first cartridge defining a plurality of annularly disposed bottomless and bottom discharging chambers, said chambers each sized to contain multiple and variously shaped capsules, and including a hollow concentric post having internal and external surfaces about the post's internal and external circumference permitting the internal surfaces on the first such cartridge to rotationally but removably engage at least one other cartridge;

a receptacle base supporting the cartridge and having a receiving tray, an annular surface providing a bottom to the cartridge chambers but with a perforation above the receiving tray, and a top and bottom design to facilitate removably stacking the receptacle base supporting said at least one other cartridge, and

means to rotate the first cartridge relative to the receptacle base and, when the first cartridge is rotationally but removably engaged to said at least one other cartridge, similarly situated chambers from each cartridge will simultaneously rotate over the perforation in each said receptacle base, whereby each said cartridge will discharge its contents into its corresponding receiving tray.

4,117,953

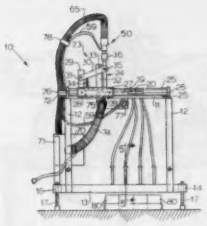
SEED PLANTING DEVICE

Harold Fredrick DeHart, Rte. 5, Box 190E, Durham, N.C. 27704

Continuation-in-part of Ser. No. 573,412, May 1, 1975, Pat. No. 3,986,638. This application Sep. 15, 1976, Ser. No. 723,545

Int. Cl.[2] **B65H** *3/08*

U.S. Cl. 221—211 **2 Claims**



1. In a seed planting device of the type having a pick-up head including seed pick-up apertures for picking up individual seeds from a bulk supply at one location and transferring such seeds to a second location for dispersal in a spaced array, improved air transfer apparatus for selectively providing a positive, negative or neutral pressure condition at said apertures, said apparatus comprising:

(a) a vacuum source having a suction port and an exhaust port;

(b) first tubular transfer means for connecting said suction port to the pick-up head;

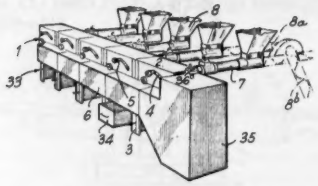
(c) second tubular transfer means for connecting said exhaust port to the pick-up head; and

(d) valve means having a hollow body portion and connecting said first tubular transfer means to said pick-up head, said valve means including closure means movable within said hollow body portion from a first lower position enabling suction from said first tubular transfer means to be applied to the pick-up head to a second higher and vertically opposite position enabling such suction to be cut off from the pick-up head, means normally biasing said valve closure means to said first position, said valve means body portion having the discharge end of said second tubular transfer means terminating therein and controlled by said closure means, said discharge end being sealed off by said closure means when said valve is in said first position and being opened when said valve closure means is raised to said second position, manual closure operator means connected internally of said body portion to said valve closure means and having an operator portion slidably mounted in said body portion for vertical movement and engagable externally thereof against said biasing means to position said closure means, and manually operable exhaust control means on said second tubular transfer means for selectively connecting or disconnecting said vacuum source exhaust port to supply a flow of exhaust air at said discharge end, whereby with said vacuum source energized, said valve means when said closure means is placed in said first position provides a negative pressure condition at said apertures, when said closure means is moved to said second position provides a neutral pressure condition at said apertures and when said closure means is moved to said second position said manual exhaust control means enables said exhaust port to be operatively connected to said second tubular transfer means discharge end to provide a positive pressure condition at said apertures.

4,117,954
METERING DEVICE FOR BULK MATERIALS, MORE PARTICULARLY CONSTITUENTS OF ANIMAL FOODSTUFFS

René Charles Pelletier, Senlis, France, assignor to Secemia, France

Continuation of Ser. No. 508,532, Sep. 23, 1974, abandoned. This application May 5, 1976, Ser. No. 683,306
Claims priority, application France, Oct. 1, 1973, 73 34992
Int. Cl.[2] B65G *33/14*
U.S. Cl. 222—134 10 Claims



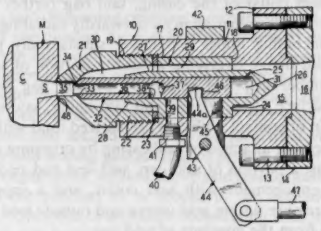
1. Apparatus for dispensing mixtures of more than one constituent of bulk material comprising a single elongate mixing and discharge conveyor, a plurality of metering conveyors each comprising a screw conveyor leading from a source of one of the constituents of each mixture and terminating at said mixing and discharge conveyor, a housing surrounding the terminus of each of said metering conveyors and the associated portion of said mixing and discharge conveyor, and means for simultaneously driving said mixing and discharge conveyor and each of said metering conveyors comprising a single motor located adjacent one of said housings and transmission means extending serially into each housing connecting said motor and an adjustable speed variator interposed between the terminus of each of said metering conveyors and said drive transmission means for driving the associated metering conveyor and for continuously and selectively varying, during operation of said mixing and discharge conveyor and the metering conveyors, the speed of said associated metering conveyors independently of the operation of the other metering conveyors, each of said housings supporting the transmission means and speed variator means associated with the respective metering conveyor and being arranged in abutment in line with each other, said discharge conveyor extending in line serially through each of said housings, said speed variator means comprising an adjustable linkage connected at one end to said transmission means and at the other end to a first uni-directional clutch member, said first uni-directional clutch member being secured between the shaft of said screw conveyor and a second uni-directional clutch member mounted on said housing, said adjustable linkage comprising a handle having a regulating crank arm pivotally mounted at one end extending through an arcuate slot in a wall of said housing opposite said screw conveyor, a crank pin movable by said transmission means, a coupling rod rotatably connected at one end to said crank pin, a spindle journalled at the other end of said coupling rod, and a tie rod adjoining said spindle and said regulating crank arm at the axis of said handle, and a connecting rod joining said spindle and said uni-directional clutch member.

4,117,955
MULTI-PORT VALVED NOZZLE FOR CO-INJECTION MOLDING

Nickolas N. Sokolow, Cheshire, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 13, 1977, Ser. No. 787,301
Int. Cl.[2] B29D *9/00*; B29F *1/03*
U.S. Cl. 222—144.5 18 Claims

1. A nozzle assembly comprising a tubular head having a first passage for a first material, a second passage for a second material, a single outlet nozzle having an orifice for both said first and second passages, a single pin cooperating with said nozzle to close the nozzle orifice and to sequentially open the orifice to said first and second passages, said tubular head having a flange on one end thereof adapted to be bolted to a mounting, a port opened and closed by said pin for selectively

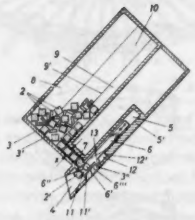


joining the second passage with the nozzle, and said nozzle being adjustable on said head toward and away from said port to vary the sequential opening of the nozzle to said first and second passages.

4,117,956
RECEPTACLE FOR THE PORTIONED DISPENSING OF THE CONTENTS THEREOF

Alfred von Schuckmann, Nordstrasse 32 a, 5657 Haan, Fed. Rep. of Germany

Filed Feb. 3, 1977, Ser. No. 765,247
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1976, 7603602[U]; Aug. 25, 1976, 2638164
Int. Cl.[2] G07F *11/00*
U.S. Cl. 221—288 12 Claims



1. A receptacle for the portioned dispensing of contents including for example tablets, pills or the like, comprising

a receptacle defining a storage space and a cover end and formed with an exit opening at the cover end, the receptacle having formed therein two channels operatively communicating with said exit opening,

walls completely surrounding and defining one of said channels, the latter being substantially complementary in cross-section to the size of the tablets and having a length equal to at least two tablets, said one channel communicating with and extending from said storage space in the receptacle and extending cross-wise to the exit opening,

the other of said two channels extending cross-wise relative to said one channel communicating therewith and extending in a longitudinal direction of said exit opening directly communicating with the latter, and

a deadweight division slider means for being disposed freely slidable in said other channel exclusively by gravity upon moving said receptacle into a tipping dispensing position with the exit opening pointing downwardly and into a neutral position with the exit opening pointing upwardly, respectively, blocking and unblocking communication between said channels, respectively,

said walls defining said one channel constituting means for forming and maintaining a direct tandem supply of tablets

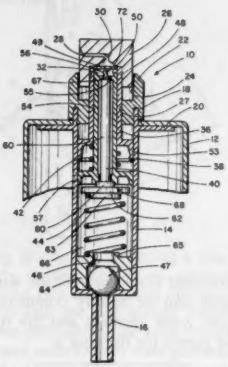
therein during the tipping dispensing position and as well as during the neutral position of the receptacle, respectively.

4,117,957

ATOMIZER VALVE ASSEMBLY

George Duffey, 720 Nolan, Glendale Heights, Ill. 60137

Filed Apr. 11, 1977, Ser. No. 786,418
Int. Cl.[2] G01F *11/38*
U.S. Cl. 222—321 18 Claims



1. An atomizer valve assembly comprising a cylinder, one-way valve means at the lower end of said cylinder, a piston having a lower skirt portion engaging the interior sidewall of said cylinder and an upper tubular portion which extends through an opening at the top of said cylinder and which has a passageway through the top thereof, an actuator mounted to said top of said piston and having a nozzle in a wall thereof and a passageway therein between said nozzle and said top of said piston, a plunger having a lower skirt portion engaging said interior sidewall of said cylinder beneath said skirt portion of said piston and an upper tubular portion which has a passageway through the top thereof and which is received within the interior of said piston tubular portion, a dispensing spring situated between said skirt portions, a valve member situated beneath said plunger and having a wide bottom portion, the area between said bottom portion and said lower end of said cylinder defining a metering chamber, a metering spring situated in said metering chamber between said lower end of said cylinder and said bottom portion of said valve member, and valve means between said valve member and said plunger for blocking flow of liquid from said metering chamber through said plunger tubular portion and said passageway at the upper end of said plunger tubular portion to said nozzle.

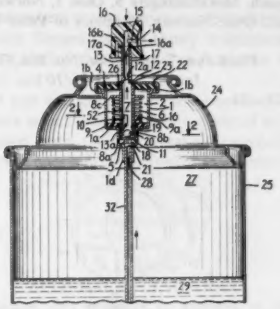
4,117,958

VAPOR TAP VALVE FOR AEROSOL CONTAINERS USED WITH FLAMMABLE PROPELLANTS

Joseph George Spitzer, 44 Coconut Row, Palm Beach, Fla. 33480; Marvin Small, 1100 Park Ave., New York, N.Y. 10021; Lloyd I. Osipow, 2 Fifth Ave., New York, N.Y. 10003, and Dorothea C. Marra, 107 Fernwood Rd., Summit, N.J. 07501

Continuation-in-part of Ser. No. 754,471, Dec. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 706,857, Jul. 19, 1976, abandoned. This application Jun. 7, 1977, Ser. No. 804,424
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—402.18 23 Claims

1. A vapor tap valve for aerosol containers for use with aerosol compositions containing liquefied flammable propellants, inhibiting delivery of flammable liquid propellant when the valve is opened in any orientation of the aerosol container, comprising, in combination, a delivery valve movable manually between open and closed positions and including a valve poppet having a passage for fluid flow therethrough, a valve stem having a valve stem passage for fluid flow therethrough, and a delivery port; bias means biasing the delivery valve poppet towards a closed position; a blending space having an open volume not exceeding about 0.2 cc for mixing propellant and aerosol composition in fluid flow communication with the valve stem passage via the valve poppet passage, the valve poppet passage when the valve poppet is in the open position communicating the blending space with the valve stem passage, and the valve poppet in the closed position preventing such communication; a liquid tap orifice in the blending space; a gas tap orifice in the blending space; and a shut-off valve disposed in association with the valve poppet and responsive to orientation of the valve to move automatically between positions opening and closing off flow of propellant to the delivery port via the valve stem passage, the shut-off valve moving into an open position in an orientation of the valve between a horizontal and an upright position, and moving into a closed position in an orientation of the valve between the horizontal and an inverted position.

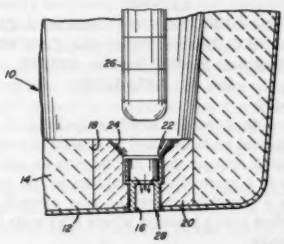


4,117,959

METHOD AND SINGLE PIECE ANNULAR NOZZLE TO PREVENT ALUMINA BUILDUP DURING CONTINUOUS CASTING OF AL-KILLED STEEL

Eugene A. Golas, Middle Township, Bucks County, and Shri N. Singh, Penn Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 715,603, Aug. 18, 1976, abandoned. This application May 5, 1977, Ser. No. 794,290
Int. Cl.[2] B22D *41/08*
U.S. Cl. 222—590 17 Claims



1. A method of preventing the accumulation of oxide inclusions on the flow surface of an orifice opening in a flow nozzle operably disposed in the pour passage of a teeming vessel for pouring a bath of aluminum-killed steels or the like comprising the steps of:

(a) forming said orifice opening of an axial length shorter

than that of the "vena contracta" of the molten metal stream flowing therethrough; and

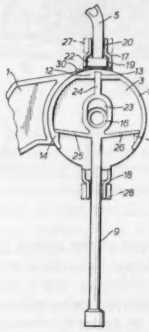
(b) providing a plenum about said orifice opening on the upstream side thereof defining a region in which the flow of molten metal is sufficiently stagnant to damp the vibrational effects imposed on the metal bath whereby the stream flowing through said orifice opening is stabilized.

4,117,960

FOLDING CLOTHES-HANGER

Peter Bengsch, Motzfeldtsgate 5, Oslo 1, Norway, and Steinar Bjørnstad, Oslo, Norway, assignors to Peter Bengsch, Oslo, Norway

Filed Jun. 7, 1977, Ser. No. 804,372
Int. Cl.[2] A47J *51/10*
U.S. Cl. 223—94 **19 Claims**



1. A folding clothes hanger comprising two arms pivoted for movement relative to each other about a common axis, both arms having each at one end a circular portion arranged coaxial with the common axis, spring means located within an enclosure comprising the said circular portions, a release member extending out from the enclosure, and a locking element, each of said circular portions having engagement means for engagement by the locking element which, when engaging both said engagement means at the same time with the arms extended, prevents relative rotation of the arms, the spring means urging the locking element into engagement with said engagement means, and the release member being operatively connected to the locking element and releasing the locking element from engagement with said engagement means when moved outwardly of the enclosure, the two arms thus being allowed to rotate towards each other.

4,117,961

DEVICE FOR OPENING OR CLOSING A ZIPPER

Billie J. Pickens, P.O. Box 68, Wilseyville, Calif. 95257

Filed Aug. 8, 1977, Ser. No. 822,393
Int. Cl.[2] A47J *51/06*
U.S. Cl. 223—111 **4 Claims**

1. A device of the type described comprising:

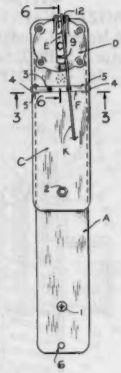
(a) a base adapted to be secured to a vertical surface;

(b) a swingable arm pivoted at one end to said base and swingable in a vertical plane parallel to the vertical surface from a position where the arm extends upwardly from its pivot into a position where it extends downward from its pivot;

(c) a spring-biased reel mounted adjacent the free end of said arm; and

(d) a cord wound on said reel and having its free end provided with a catch for removably engaging with the handle of a zipper body, said reel having a spring which is tensioned when the cord is unwound from the reel;

(e) whereby when the arm extends upwardly from the pivot, the cord can be unwound from the reel for winding the spring and the catch can be readily connected to the zipper handle on a garment being worn and the spring biased reel will pull the zipper for closing it and when the arm extends downwardly from the pivot, the cord can



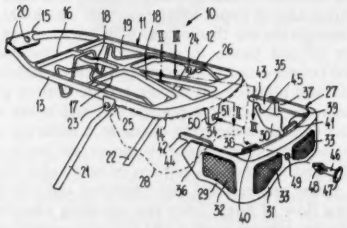
again be unwound from the reel for winding the spring and the catch can be readily connected to the zipper handle on the worn garment and the spring biased reel will pull the zipper for opening it.

4,117,962

BICYCLE LUGGAGE CARRIER EQUIPPED WITH RECOGNITION AND SAFETY DEVICE

Oskar Pletscher, Marthalen, Switzerland, assignor to Gebruder Pletscher, Marthalen, Switzerland

Filed Dec. 26, 1976, Ser. No. 754,406
Claims priority, application Austria, Jan. 16, 1976, 273/76
Int. Cl.[2] B62J *5/20*
U.S. Cl. 224—31 **7 Claims**



1. A bicycle luggage carrier equipped with a recognition and safety device, comprising:

a frame having a rear end portion;

a holder bracket;

means for hingedly connecting the holder bracket at the rear end portion of the frame;

a spring operatively associated with the hingedly connecting means for biasing the holder bracket against the frame;

skirt means mounted to the rear end portion of the frame and depending downwardly therefrom for mounting reflector means;

said skirt means including a support plate and a pair of spaced lateral flap members between which there is arranged the support plate;

said skirt means extending about the rear end portion of the frame and housing said spring to thereby provide a cover for the spring to protect a user from injury by the spring;

said frame including side struts and a rear strut each having undersides;

said skirt means having an inner surface provided with up-

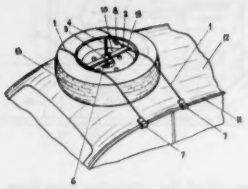
wardly open channel means engaging said side struts and said rear strut of the frame from the undersides thereof.

4,117,963

SPARE WHEEL AND TIRE HOLDER

Kazimierz Luczynski, 2866 Keele St., Apt. 5, Downsview, Ontario, Canada (M3M 2G8)

Filed May 9, 1977, Ser. No. 795,356
Claims priority, application Canada, Jan. 18, 1977, 269942
Int. Cl.[2] B60R *9/04*
U.S. Cl. 224—42.1 B **7 Claims**



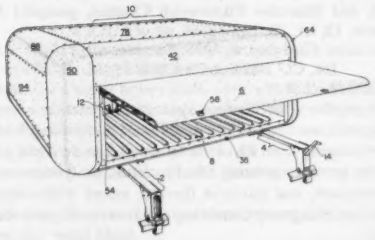
1. A fastening device for mounting a spare wheel and tire disposed directly on the roof of an automobile having roof gutters, comprising two cable means operative to dispose over said spare wheel and tire and extend transversely over said roof, catch means provided at the ends of said cable means for securement of said ends to said roof gutters, length adjusting means provided on said cable means and operative to vary the length of said cable means, a bar member slidably mounted on said cable means and engageable with said spare wheel and tire, securing and tensioning means provided on said bar means operative to engage with said spare wheel and tire and adjustable cooperative with said spare wheel and tire for increasing the tension in said cable means so as to draw said cable means bindingly and tightly against said spare wheel and tire to fasten the latter over said roof.

4,117,964

CAR TOP CARRIER ASSEMBLY

Howard M. Sage, Phoenix, and John C. Abromavage, Tempe, both of Ariz., assignors to U-Haul International, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 794,900, May 9, 1977. This application Jun. 30, 1977, Ser. No. 811,932
Int. Cl.[2] B60R *9/04*
U.S. Cl. 224—42.1 E **11 Claims**



1. A car top carrier assembly of a carrier container having a bottom surface operatively interconnected to the top surface of a horizontally disposed means for mounting said carrier container, and comprising

(A) a container characterized by an overall rectangular solid configuration, wherein the edges and corners are radiused between all intersections of planar surfaces otherwise defining said container configuration; wherein,

(B) said container has a frame comprised of a horizontal deck member, which defines the bottom surface of said container, vertical corner supports, which define the four vertical corners of said container, and horizontal edge supports, which define the four horizontal upper edges of said container; wherein, further,

(C) each of said corner supports and each of said edge supports includes a perimetrical flange, wherein opposite ends of the upper horizontal edge supports, and upper portions of said vertical corner supports, include mating flange portions that are flangedly interconnected to define load-bearing portions of said container, and wherein, further,

(D) planar members extend between exposed portions of the perimetrical flanges on said thusly interconnected frame to thereby define the top and at least one side of said container, and

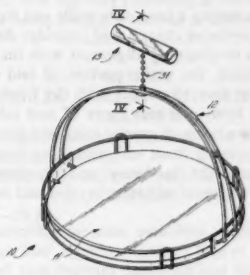
(E) at least one vertical side of said container includes an access door which is structurally supported by, and operably mounted upon, the horizontal edge support and vertical corner supports which define said at least one vertical side.

4,117,965

SELF-BALANCING TRAY

Donald D. Rienzo, Dix Hills, N.Y., assignor to Allan Tackle Manufacturing Co., Inc., Hicksville, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,638
Int. Cl.[2] A47G *23/06*
U.S. Cl. 224—48 R **9 Claims**



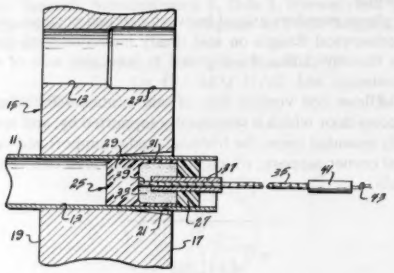
1. A self-balancing tray for carrying open receptacles containing spillable contents, fragile items or items splattering when falling down, said tray comprising:

a disc of substantially rigid material; and an assemblage for mounting the disc and carrying the same in always substantially horizontal position, said assemblage comprising a frame shaped to encompass the rim of the disc with a loose fit, lugs inwardly protruding from the frame fixedly secured thereto and underlying the disc upon placement thereof into the frame, thereby supporting the disc; and a holder shaped to extend across the frame spaced apart therefrom to provide space for placing receptacles and other items upon the disc, mounting means for releasably attaching the holder to the frame and locking the disc within the frame, said mounting means including two pairs of receiving openings and disposed at opposite points of the frame and at each end of the holder a pair of spaced apart lugs insertable into the respective openings on the frame, said lugs on the holder being insertable into said openings at the frame and being dimensioned to overlie the disc thereby locking the disc in the frame; and a handle including a grip and a freely bendable connecting member secured at one end to the grip and at the other end to the holder at a point thereof coaxial with the center point of the disc.

4,117,966
EXPLOSIVE WELDING OF A TUBE INTO A TUBE SHEET

Sheryll C. Green, London, and Vonne D. Linse, Columbus, both of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 13, 1977, Ser. No. 841,614
Int. Cl.[2] B23K *21/00*
U.S. Cl. 228—2.5 **6 Claims**



1. An assembly for the explosive welding of a metal tube within an opening of a metal tube sheet having a front face aligned near one end of said tube and a rear face towards the major portion of the tube length, said assembly comprising in combination with said tube positioned within said tube sheet opening:

a cartridge including a base, side walls and front wall, containing an explosive charge, said cartridge disposed within said tube in overlapping alignment with the front face of said tube sheet, the major portion of said charge being positioned in near alignment with the front face, but between said front and rear faces of said tube sheet, said cartridge base being of greater mass and greater thickness than the opposing front wall and being located between said charge and the rear face of said tube sheet to minimize explosive bulging of said tube beyond said rear tube sheet face;

a cord containing explosive material sufficient to transmit detonation to said explosive charge, said cord extending from outside said cartridge through said front wall and through said explosive charge to the rear portion of said charge adjacent to said cartridge base; and

a tubular shield encompassing said cord from a location outside said cartridge to a location within the rear portion of said explosvie charge but short of the end of said cord to expose said cord end to said explosive charge.

4,117,967
SOLDER EXTRACTOR APPARATUS

Ephraim Regelson, Kensington, Md.; Leonard G. Terral, China Lake, Calif.; Ronald J. Matusiak, El Cajon, Calif.; Jerry L. Trotter; William L. Rea, both of San Diego, Calif., and Edward L. Mangel, Poway, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 26, 1977, Ser. No. 800,972
Int. Cl.[2] B23K *3/00*; F04B *37/10, 39/12*
U.S. Cl. 228—20 **8 Claims**

1. Solder extractor apparatus for use with a hollow solder extractor iron comprising:

a chassis;

an electric motor and pump assembly for generating a vacuum input and a pressure input;

said inputs being available at a single common port on said chassis;

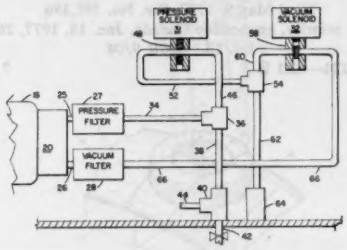
means for selectively connecting one of said inputs through the port ot said solder extractor iron;

a circuit for connecting said motor to a secure of power;

a holder for supporting said solder extractor iron;

a switch on said holder operable to a closed position by the absence of the solder extractor iron;

said switch being electrically connected in said circuit with said motor;



whereby removal of the extractor iron from its holder will close the switch and energize the motor and pump assembly making said selected input automatically available to the solder extractor iron upon the commencement of the solder extraction operation.

4,117,968
METHOD FOR SOLDERING METALS WITH SUPERHARD MAN-MADE MATERIALS

Jury Vladimirovich Naidich, ulitsa Vernadskogo, 85, kv. 48; Galina Alexeevna Kolesnichenko, ultisa Prazhskaya, 3, kv. 128; Nikolai Stepanovich Zjukin, ulitsa Kurskaya, 8a, kv. 59; Boris Dmitrievich Kostjuk, ulitsa Marshala Malinovskogo, 3a, kv. 206; Stanislava Stanislavovna Shaikevich, ulitsa Volodarskogo, 69, kv. 7; Yaroslav Feodosievich Motsak, ulitsa Dorogozhitskogo, 26, kv. 7, all of Kiev; Vitaly Pavlovich Fedulaev, stantsia Ukhtomskaya, ulitsa N.Tupik, 5, Moskovskaya oblast, Ljuberetsky raion; Nikolai Alexandrovich Kolchemanov, ulitsa Moskovskaya, 33; Valentin Mikhailovich Ugarov, Oktyabrsky prospekt, 263, kv. 3, both of Ljubertsy Moskovskoi oblasti; Viktor Vasilievich Losev, ulitsa Planernaya, 5, korpus 1, kv. 174, Moscow; Mark Simonovich Drui, ulitsa Chekhova, 4, kv. 93, Leningrad; Alla Alexandrovna Lavrinovich, ulitsa Shvernika, 16, kv. 51, Leningrad; Dmitry Fedorovich Shpotakovsky, ulitsa Shvernika, 16, kv. 50, Leningrad, and Stanislav Viktorovich Chizhov, prospekt Morisa Toreza, 13, kv. 28, Leningrad, all of U.S.S.R.

Filed Sep. 4, 1975, Ser. No. 610,225
Int. Cl.[2] B23K *1/20*; C04B *31/16, 41/38*
U.S. Cl. 228—124 **10 Claims**

1. A method for coating synthetic diamonds comprising coating said material with a metal melt comprising lead in an amount varying from 2 to 15% by weight, and a metal selected from the group consisting of chromium, molybdenum, tungsten, tantalum, and mixtures thereof; mixed with a metal selected from the group consisting of silver, or tin, and mixtures thereof.

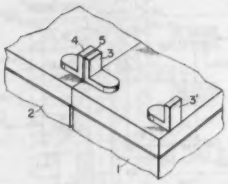
2. A method for coating a material selected from the group consisting of boron nitride and synthetic diamonds, comprising:

applying to the surface of said material a metallizing coating consisting essentially of a first layer of an adherent metal selected from the group consisting of chromium, molybdenum, tungsten, and tantalum; and a second layer of a metal of reduced oxidizability selected from the group consisting of silver, lead, and tin; wherein the adherent metal varies from 3 to 65 percent by weight of the metallizing coating.

4,117,969
METHOD FOR INTERCONNECTING ADJACENT ELECTRIC STORAGE BATTERIES

Kiyohide Fukuba, Uji, Japan, assignor to Japan Storage Battery Company Limited, Kyoto, Japan

Filed Oct. 20, 1976, Ser. No. 734,051
Claims priority, application Japan, Oct. 22, 1975, 50-127795; Oct. 22, 1975, 50-127796
Int. Cl.[2] H01M *2/26, 2/32;* B23K *3/06*
U.S. Cl. 228—140 8 Claims

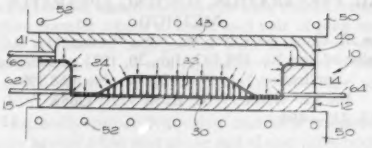


1. A method of electrically and mechanically interconnecting adjacent electric storage batteries, comprising:
(a) inserting a foil sheet of alloy having a melting point in a range of from 40° C. to 180° C. between the planar surfaces of adjacent terminals of said batteries, said foil sheet having fusion-detecting lugs extending outward from the edges thereof, said planar surfaces forming a gap therebetween in the range of 0.02mm to 0.5mm, and
(b) heat-fusing said foil sheet of alloy.

4,117,970
METHOD FOR FABRICATION OF HONEYCOMB STRUCTURES

C. Howard Hamilton, Thousand Oaks, and Leonard A. Ascani, Jr., Palos Verdes Estates, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 16, 1976, Ser. No. 742,298
Int. Cl.[2] B23K *31/00*
U.S. Cl. 228—173 A 14 Claims

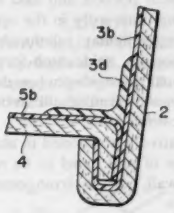


1. A method for making a honeycomb metallic structure in a single operation comprising the steps of:
positioning a metal honeycomb core, a first metal blank, and a second metal blank within a hollow forming apparatus for the duration of the method, the first metal blank having superplastic characteristics, the first metal blank and the second metal blank each having opposed principal surfaces;
positioning the core between the first metal blank and the second metal blank;
bringing the first metal blank to within a temperature range suitable for superplastic forming of the first metal blank;
applying a pressure loading across the principal surfaces of the first metal blank causing the first metal blank to deform superplastically against, and into intimate contact with, the core and the second metal blank; and
maintaining the first metal blank, the second metal blank, and the core under coordinated temperature-pressure-time duration conditions sufficient to produce metallurgical bonding of the first metal blank, the second metal blank, and the core to one another.

4,117,971
PAPER CUPS

Tsutomu Itoh, Tokyo, Japan, assignor to Onoda Cement Company, Ltd., Onoda, Japan

Filed Nov. 7, 1977, Ser. No. 848,950
Claims priority, application Japan, Nov. 18, 1976, 51-154709[U]
Int. Cl.[2] B65D *3/10*
U.S. Cl. 229—1.5 B 2 Claims

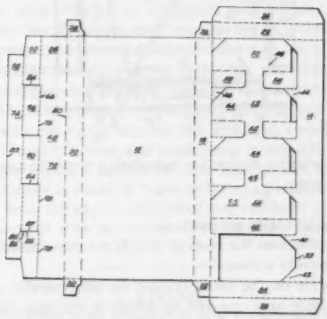


1. In a cup suitable for holding and storing hot or cold liquids, said cup having a body of paper forming the sides thereof, a bottom of paper joined to said sides by a folded interlock, said sides at the top thereof being rolled into a lip; said sides having a seam formed of overlapping portions bonded together, the improvement comprising:
a continuous unitary liner of a film of liquid impervious, heat and cold resistant material formed on the assembled cup body and coating the inside surface of the sides and the bottom of said cup and extending around said rolled lip; said liner being securely bonded to said paper body.

4,117,972
MULTI-CELLED CARTON WITH SELF-LOCKING FEATURE

Thomas J. Sellors, Waukegan, Ill., assignor to Potlatch Corporation, San Francisco, Calif.

Filed Mar. 21, 1977, Ser. No. 779,356
Int. Cl.[2] B65D *5/48*
U.S. Cl. 229—28 R 7 Claims



1. A catch-forming arrangement formed from a single piece of paperboard capable of forming at least one catch for retaining one edge of a panel of a carton,
said single piece of paperboard having first and second discontinuous fold lines and a plurality of parallel cut lines disposed in transverse relationship to said discontinuous fold lines,
said first and second discontinuous fold lines defining a parallelogram-shaped panel between said adjacent cut lines,
said first discontinuous fold line and one edge of said single

piece of paperboard defining therebetween a first attachment portion,

said second discontinuous line and the other edge of said single piece of paperboard defining therebetween a second attachment portion,

said first and second discontinuous fold lines defining therebetween a catch-forming wall portion,

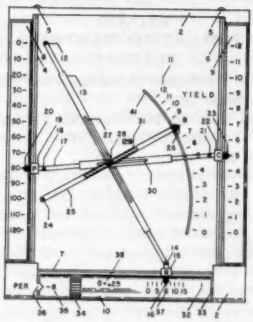
said first attachment portion extending outwardly in one direction is substantially perpendicular relationship to said catch-forming wall portion and said second attachment portion extending outwardly in the opposite direction in substantially perpendicular relationship to said catch-forming wall portion, said catch-forming wall portion having a flat planar disposition when disposed in a knock-down disposition and forming at least one said catch when in a set-up disposition,

said catch cooperatively positioned in abutting relationship to said one edge of said panel to be retained when said catch-forming wall portion arrangement is in its set-up disposition.

4,117,973
CALCULATING DEVICES

Eugene W. Bold, 51 Saint Andrews Rd., Severna Park, Md. 21146

Filed Jul. 6, 1976, Ser. No. 702,711
Int. Cl.[2] G06G *1/14*
U.S. Cl. 235—61 B **3 Claims**



1. A calculating device for calculating bond factors and the like comprising:

a base;

two parallel scales on the base;

an extensible arm the ends of which are movable along said two parallel scales;

a third scale on the base between the said parallel scales;

an extensible arm one end of which is movable along said third scale and the other end pivotable about a point near the first parallel scale;

a fourth scale on the base near the second parallel scale;

an arm one end of which is movable along said fourth scale and the other end pivotable about a point near the first parallel scale;

means for interconnecting the three arms in a point; and

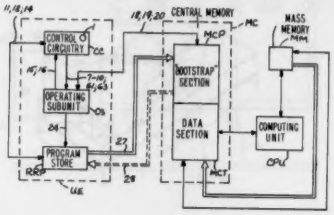
means for permitting free movement of the three arms;

said calculating device being capable, through the process of matching values on the said third and fourth scales, of displaying answers in terms of one variable when all but one variable are given.

4,117,974
DEVICE FOR AUTOMATICALLY LOADING THE CENTRAL MEMORY OF ELECTRONIC PROCESSORS

Alberto Ciaramella, Rivoli (Turin), Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Dec. 23, 1976, Ser. No. 753,780
Claims priority, application Italy, Dec. 24, 1975, 70182 A/75
Int. Cl.[2] G06F *11/00*; G11C *29/00*
U.S. Cl. 235—304 **10 Claims**



1. In an electronic data-processing system including a central memory, computing means for executing a main program on data stored in said central memory, and a mass memory containing data to be selectively introduced into said central memory preparatorily to the execution of said main program,

the combination therewith of an external unit, independent of said computing means, comprising:

storage means containing an ancillary program to control the selective introduction of data from said mass memory into said central memory;

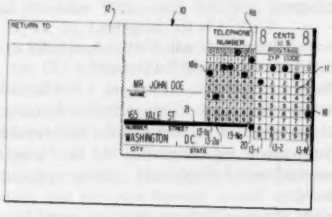
operating means connected to said storage means for carrying out a transfer of at least a part of said ancillary program to said central memory in response to a starting command; and

check means connected to said operating means for verifying the correct performance of said transfer and halting said transfer upon detecting a malfunction.

4,117,975
MAIL PREPARATION, SORTING APPARATUS AND METHOD

Damon M. Gunn, 4007 49th St., NW., Washington, D.C. 20016

Division of Ser. No. 158,187, Jun. 30, 1971, abandoned. This application Feb. 17, 1976, Ser. No. 658,799
Int. Cl.[2] G06K *19/08*; B23K *9/10*; G06K *7/14*
U.S. Cl. 235—494 **12 Claims**



2. An address label adapted to be placed on an article to facilitate automatic sorting and distribution of the article, said label comprising:

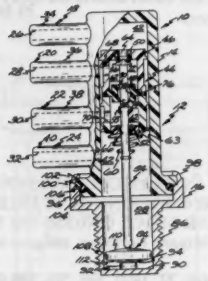
(a) a distinctive guide mark adapted to be recognized by an automatic reading device;

(b) a plurality of machine-readable code marks, the position of said code marks in relation to said guide mark representing a number that is distinctive of the particular address or addressee, said number being automatically convertible to street address information by means of a memory bank in which distinctive numbers are stored together with corresponding stress addresses.

4,117,976
MULTI-FUNCTION THERMOSTATIC VALVE

John Doherty, Jr., Assonet, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 17, 1976, Ser. No. 724,182
Int. Cl.[2] G05D *23/10*
U.S. Cl. 236—48 R 10 Claims



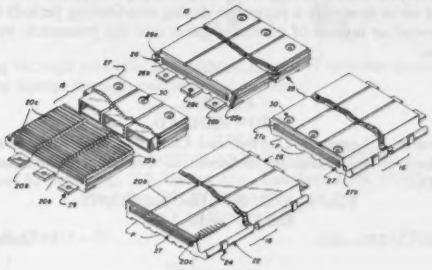
1. A thermally responsive valve assembly comprising a valve body, said body having a central chamber with a first and a second passage therein which are sealingly separated one from another, two valve seats disposed in said body, the first positioned in said first passage and the second positioned in said second passage, and valve switching means including a bimetallic disc assembly and valve seat sealing means, said disc assembly having two bimetallic members which are movable in response to temperature change at respective, distinctly different temperatures to cause said valve seat sealing means to move into and out of engagement with said first and said second seats thereby providing communication in only the first passage, communication in only the second passage, and communication in both passages, said valve switch means further comprising a first and a second plug member to respectively seal said first and said second valve seats, motion transfer means positioned to be in contact with said bimetallic disc assembly and to be movable in response to movement of disc assembly and a sealing member sealingly and slidably engaging said motion transfer means thereby allowing free movement of said motion transfer means to cause said pair of plug seals to move into and out of engagement with said valve seats in response to movement of said bimetallic members while still providing for isolation of the first passage from said second passage.

4. A thermally responsive valve assembly comprising a valve body having a first part at one end of said valve body and a second part at another end of said body, the first part of the body having a first, a second, a third, and a fourth port, said ports being adapted for connection to fluid lines, a central cavity into which all ports communicate, two passages defined in said body, said first passage connecting said first port and second port and said second passage connecting said third port and said fourth port, two valve seats disposed in said body, the first positioned in said first passage and the second positioned in said second passage and valve switching means movable into and out of engagement with said first and second seats thereby providing for communication in only the second passage, communication in both passages, and communication in only the first passage, said valve means comprising a first and a second plug member to respectively seal said first and second valve seats, a bimetallic assembly having two bimetallic members each responsive to temperature change, said members actuable at different temperatures thereby providing for the bimetallic assembly having a first, a second, and a third position, a motion transfer means causing said first and said second plug members to move from engagement with said first valve seat to engagement with neither of the two valve seats to engagement with said second valve seat when bimetallic assembly moves respectively from said first position to said second position to said third position, and a sealing member sealingly and slidably engaging said transfer means for isolating said first passage from said second passage and the second part of the body including a thermlly conductive portion adapted for heat-exchange with an object, such as an engine, for transferring heat to and from said bimetallic member to increase and decrease the temperature of the member in response to a corresponding increase and decrease in temperature of said object.

4,117,977
HIGHWAY-RAILWAY CROSSING

Jacob O. Whitlock, Springfield, Ill., assignor to Structural Rubber Products Company, Springfield, Ill.

Filed Oct. 14, 1976, Ser. No. 732,366
Int. Cl.[2] E01C *9/04*
U.S. Cl. 238—8 15 Claims



11. In a highway crossing for a railroad wherein each of a pair of rails has a base section and a head section interconnected by a web section and wherein a plurality of spaced substantially parallel ties extends transversely of the rails and is secured thereto in subtending supporting relation, the combination comprising: at least one pair of elongated laterally-resilient gage section units adapted to be arranged in side-by-side relation intermediate the rails, said units having corresponding elongated resilient inner faces in abutting relation and the combined width of the adjacent units, prior to assembly, being slightly greater than the spacing between the web sections of said rails so as to provide a resilient compressive fit between said units which forms an elongated substantially moisture-proof joint therebetween, each unit having an elongated outer face adapted to be disposed adjacent the web section of a rail and in substantial engagement therewith, the abutting inner faces of said gage section units being provided with interfitting male and female segments respectively integral with said gage section units, each gage section unit including a resilient moisture-proof upper lamina, and reinforcing means affixed to said lamina, the exposed surface of said lamina intermediate the outer and inner surfaces of a unit defining a plane substantially coplanar with the upper surfaces of said rail head sections and being provided with means for effecting drainage of said exposed surface.

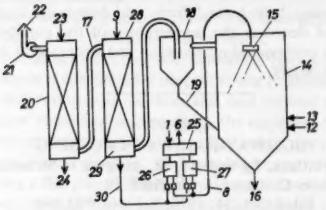
4,117,978
SYSTEM FOR FEEDING SOLUTIONS AND SUSPENSIONS

Heribert Fuchs, Vienna, Austria, assignor to Ruthner Industrieanlagen-Aktiengesellschaft, Vienna, Austria

Filed Feb. 1, 1977, Ser. No. 764,561
Claims priority, application Austria, Jan. 29, 1976, 621/76
Int. Cl.[2] B05B *15/02*
U.S. Cl. 239—112 7 Claims

1. A system for feeding solutions and suspensions to nozzles for spraying the solution or suspension into a heated furnace chamber, comprising at least one blow case for feeding the solution or suspension to the nozzles under the action of a compressed displacing gas and means for measuring the volu-

metric flow rate and instantaneous pressure of the displacing gas, a plurality of blow cases operating with a phase displacement, displacing gas supply conduits for supplying compressed displacing gas to respective blow cases, and purge gas supply



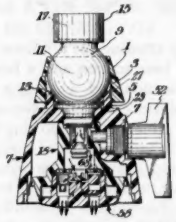
conduits which join respective displacing gas supply conduits and serve to supply a purge gas during non-feeding periods to prevent an ingress of corrosive gases into the pneumatic system.

4,117,979

SHOWERHEAD

Carmen J. Lagarelli, Clayton, and Charles J. Rudewick, Bear, both of Del., assignors to Speakman Company, Wilmington, Del.

Filed Apr. 15, 1977, Ser. No. 787,971
Int. Cl.[2] B05B *1/08*
U.S. Cl. 239—381 **10 Claims**



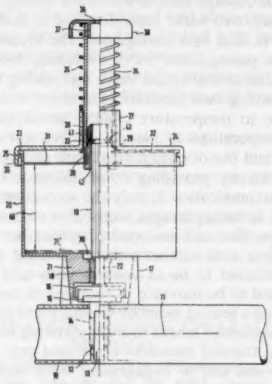
1. A showerhead which can be adjusted for delivering a continuous water spray or a pulsating water spray comprising a housing which is open at the bottom and has a passageway extending through the top, valve means which includes a plunger guide supported in the housing passageway and extending down into the housing interior and a hollow face plate open at both ends having an upper bore portion positioned around and supported by the plunger guide whereby an annular cavity is formed between the inner housing wall and the face plate wall, said face plate being capable of moving axially of the plunger guide, an opening in the top of said plunger guide through which water is received to be directed either through a face plate or the housing depending upon the axial position of the face plate, a seal supported by the upper portion of the guide, a seal supported by the lower portion of said guide, means for moving the face plate axially of said guide whereby when the face plate is raised to its uppermost position the upper end of the face plate seats against the upper guide seal to block off water flow passing through said annular cavity and to direct the flow downwardly through the bore section of the hollow face plate, and whereby when the face plate is lowered to its lowermost position the bore section of the face plate moves downwardly around the lower seal to block off water flow through the face plate whereby the water flow is directed through said annular cavity, a spray face member having slots attached to the bottom of the face plate for discharging water passing through the hollow face plate, a rotatable turbine wheel having blades positioned above and supported by the spray face member, a water diffuser plate positioned above the turbine wheel to direct water flow into said turbine wheel, said water diffuser plate having a central cage which fits within a cavity formed by the inner ends of the turbine wheel blades with ports in said cage through which water is discharged to the blades, and a sectoral blade integral with the turbine wheel spaced below said blades for intermittently offering resistance to water passing from the blades of the turbine wheel to the outlet slots in the spray face to deliver a pulsating water spray.

4,117,980

IMPLEMENT, IN PARTICULAR A HOUSEHOLD IMPLEMENT, FOR CHOPPING CUTTABLE MATERIAL, IN PARTICULAR MEAT, ONIONS OR THE LIKE

Horst Hartmann, Stuttgart, Germany, assignor to Zyliss Zysett AG, Switzerland

Filed Mar. 22, 1977, Ser. No. 780,097
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1976, 2614018
Int. Cl.[2] B02C *18/26*
U.S. Cl. 241—37.5 **22 Claims**

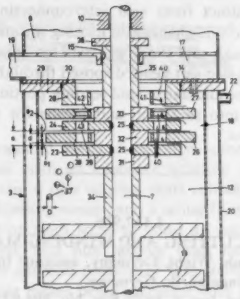


1. Apparatus for cutting foods comprising a cup-like container, a base supporting said container, drive means located in said base having a rotatable shaft the upper end of which extends into said container, a removable cover for said container, said cover having an integral sleeve extending upwardly therefrom, an elongated plunger located in said sleeve and having an inner end facing said container, said sleeve and said plunger having cooperative keying means permitting said plunger to move relatively axially but non-rotationally within said sleeve, cutting means comprising a head secured to the inner end of said plunger to be rotationally but not axially movable relative thereto, said head having at least one knife extending radially therefrom, and a central opening in said knife head adapted to fit over the upper end of said shaft, said central opening and said shaft, being cooperatively connected by keying means permitting relative axial movement and conjoint rotational movement of said cutting means with said shaft upon movement of said plunger a selected distance through said sleeve into said container, and spring means for normally biasing said plunger in an outward direction of said container by at least said selected distance, said cover, said plunger and said knife head being connected so that upon removal of said cover from said container said knife head is disengaged from said shaft and together with said plunger and cover is removed from said container.

4,117,981
STIRRING MILL

Kaspar Engels, Mannheim, Germany, assignor to Draiswerke GmbH, Mannheim-Waldhof, Germany

Filed Jun. 29, 1977, Ser. No. 811,183
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631623
Int. Cl.[2] B02C *23/16*
U.S. Cl. 241—46.15 16 Claims



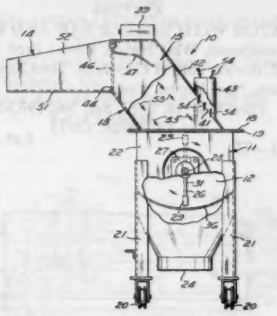
1. In a stirring mill with fine grinding and/or dispersal of flowable grinding stock, the mill including a grinding container provided with a mixing shaft rotatably drivable and fitted with mixing tools; grinding stock inlet means in the vicinity of one end; a ground stock outlet means in the vicinity of the other end; and a separating means disposed in front of the ground stock outlet means to hold back grinding medium located in the grinding container, said separating means being formed by rotatable annular disks defining spaces between them which extend radially outward with respect to said shaft, said annular disks being mounted concentrically on a shaft, and the width of the spaces being smaller than the diameter of the smallest particle of grinding medium to be used, the improvement wherein some of said annular disks are axially nondisplaceable, are fixed to said shaft and are rotatable therewith, a respective axially freely movable annular disk disposed about said shaft, between each two of said axially nondisplaceable annular disks and having apertures therein, those of said disks which are fixed to said shaft and also are between said axially movable disks also having apertures therein, and the sum of widths of two spaces delimited by said axially movable annular disk is smaller than the diameter of the smallest particle of grinding medium to be used.

4,117,982
ASBESTOS DELUMPER

Michael Slywka, Parma, Ohio, assignor to The Gibson-Homans Company, Cleveland, Ohio

Filed May 23, 1977, Ser. No. 799,471
Int. Cl.[2] B02C *23/26*
U.S. Cl. 241—51 4 Claims

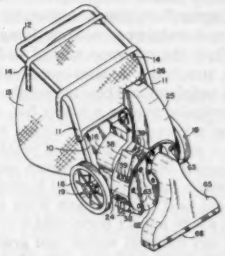
1. Apparatus for disjoining compacted asbestos and like material, comprising a generally closed housing, an entrance at an upper portion of one face of the housing for passage of compacted material therethrough into the housing, an agitation zone within the housing communicating with the entrance, means in the agitation zone for mechanically disjoining compacted material, a discharge opening in the housing underlying the agitation zone for releasing material disjoined by said mechanical disjoining means from the housing, an air inlet in the housing overlying said agitation zone, said air inlet being generally between said material entrance and said agitation zone, whereby discharge of material and air through said discharge opening is adapted to induce air flow into said housing through said inlet and prevent escape of airborne particulate matter through said material entrance.



4,117,983
LEAF COLLECTOR AND COMMINUTOR

Paul E. Browning, 300 Station Ave., Langhorne, Pa. 19047

Filed Oct. 27, 1977, Ser. No. 846,119
Int. Cl.[2] B02C *13/04*
U.S. Cl. 241—55 6 Claims



1. A mobile leaf collector and comminutor comprising
a frame,
spaced wheels supporting said frame,
a collection receptacle carried by said frame rearwardly of said wheels,
a driving motor carried by said frame above said wheels and having a rotary drive shaft,
a blade housing disposed forwardly of said wheels and into which said drive shaft extends,
said blade housing having a portion communicating with the interior of said receptacle,
a blade hub mounted on said shaft for rotation therewith,
a plurality of blade members having cutting edge portions,
a leaf spring connecting a plurality of said blade members with said blade hub for yieldingly retaining said blade members in operating position,
a plurality of shear bars pivotally mounted on said housing and having a resilient member for yieldingly retaining said bars in operating position,
said shear bars being spaced for passage therebetween of said blade members for comminution of leaves in said housing,
a downwardly extending leaf pick up nozzle carried by and extending forwardly of said housing and having a horizontal opening for entry of leaves and delivery of leaves to the interior of said housing, and
said blade hub having an associated fan portion for drawing

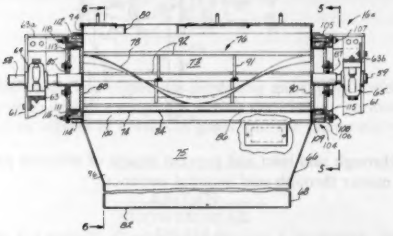
leaves into said housing and delivery of comminuted leaves into said receptacle.

4,117,984

GRANULATOR WITH BEATER BAR AND DEFLECTOR

Paul M. Waxelbaum, West Haven, Conn.; Fred A. Harris, and William J. Brown, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed May 16, 1977, Ser. No. 796,932
Int. Cl.[2] B02C *13/13*
U.S. Cl. 241—73 **5 Claims**



1. A granulator, comprising:

(a) housing means having an entrance and an outlet for defining a granulation zone therewithin;

(b) screen means, attached to said housing, for dividing said granulation zone into an inlet region above said screen means and an outlet region below said screen means;

(c) beater assembly means, including a rotatable cage having two coaxial spaced endplates; a plurality of beater bars attached to said endplates; each bar lying parallel to and equidistant from the common axis of said endplates, and drive means, attached to at least one of said endplates, for rotating said endplates and beater bars about said common axis, for repeatedly passing a beater bar within said inlet zone in close proximity to said screen so as to force a portion of any material between said beater bar means and said screen means through said screen means, and

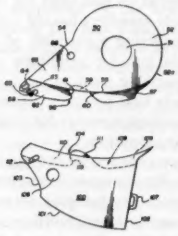
(d) deflector means, attached to said beater bars and lying wholly toward said common axis from said beater bars, for applying a low impact horizontal force component to a portion of any material within said granulation zone to move said portion from a first location below and adjacent to said entrance toward a second location horizontally spaced from said first location to create a desired material flow distribution through said screen means.

4,117,985

SHREDDER HAMMER WITH REPLACEABLE TIP

Jack A. Lazareck, Box 26, Group 509, R.R. 5, Winnipeg, Manitoba, Canada (R2C 2Z2)

Filed Jun. 16, 1977, Ser. No. 807,221
Claims priority, application Canada, May 12, 1977, 278244
Int. Cl.[2] B02C *13/28*
U.S. Cl. 241—197 **10 Claims**



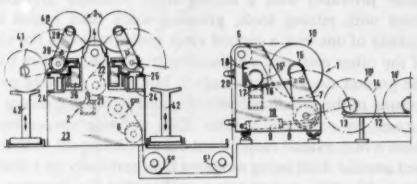
1. A hammer of the type used in shredding operations comprising: a shank member adapted to be secured on a supporting shaft; and a replaceable tip member which is subject to wear substantially along the leading and lower portions thereof; means for interconnecting said shank and said tip, said interconnecting means comprising a tongue and groove interrelationship for slidably interconnecting said shank and said tip along a common face, and a cooperating keyway pocket and hooked key on said shank and said tip, with a significant operative interengaging portion of such keyway pocket/hooked key being within said shank and being so interrelated as to tend to retain said tip on said shank during use; and locking means, separate and distinct from said interconnecting means, for locking said tip to said shank, said locking means comprising a slot passing through said shank and said tip adjacent the trailing edge thereof, said slot being disposed through a side of said tip which is perpendicular to said leading portion of said tip a wedge inserted into said slot; and means for retaining said wedge in said slot.

4,117,986

ROLLER CUTTING AND WINDING MACHINE

Armin Hutzenlaub, Wiehl, Germany, assignor to Firma Erwin Kampf Maschinenfabrik, Germany

Filed Jun. 9, 1977, Ser. No. 804,923
Int. Cl.[2] B65H *35/02*
U.S. Cl. 242—56.2 **12 Claims**



1. In a roller cutting and winding machine to cut a broad material band into a plurality of longitudinal strips and form the strips into individual coils, the combination therewith comprising:

(a) a pair of spaced apart shield plates;

(b) a deflecting and supporting roll mounted at its opposite ends between said shield plates;

(c) a pair of traverse members each having a profile rail thereon and being supported on said shield plates on opposite sides of said deflecting and supporting roll;

(d) a cutting device operatively associated with a counter cutting roll and supported between said shield plates to cut a broad material band into longitudinal strips;

(e) a plurality of winding-on stations mounted on said traverse members and operatively associated with said deflecting and supporting roll to form individual coils of the longitudinal strips upon said winding-on stations, said winding-on stations each comprising bracket means and a pair of swivel arms mounted adjacent one end thereof on shaft means journaled in said bracket means for swivelling movement of said swivel arms about a swivel axis defined by the longitudinal axis of said shaft means, clamping heads carried on said swivel arms adjacent the free ends thereof and adapted to carry a coil tube thereon, and a toothed wheel concentrically keyed to said shaft means said bracket means being supported on said traverse members and being longitudinally movable thereon to, and clampable in, a selected position thereon; and

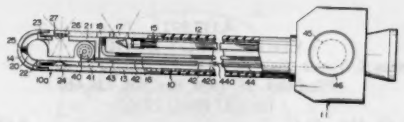
(f) a powered tooth rack engaged with said toothed wheel whereby movement of said tooth rack swivels said swivel arms about their swivel axis between a coil winding-on position and a coil depositing position.

4,117,987

FILM CASSETTE FOR AN ENDOSCOPE

Takeshi Okada, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 703,606, Jul. 8, 1976, Pat. No. 4,038,977. This application May 17, 1977, Ser. No. 797,689
Claims priority, application Japan, Jul. 11, 1975, 50-85077
Int. Cl.[2] G03B *1/04, 15/14;* **A61B** *1/06*
U.S. Cl. 242—71.2 **2 Claims**



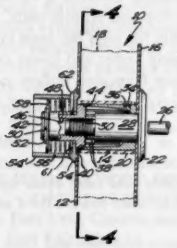
1. A film cassette for an endoscope comprising a cassette housing means with an exposure window and with a film received therein, a film take-up shaft rotatably supported by said cassette housing means, and a string frictionally engaging said film take-up shaft so as to wind up said film when said string is pulled, said film take-up shaft including a pulley around which one end portion of said string is wound, said cassette housing means being provided with a rib close to the outer periphery of said pulley and having at least one cut-out section from which said string is delivered, the remaining portion of said rib preventing said string from being disengaged from said pulley.

4,117,988

REEL ADAPTER FOR TIE MATERIAL AND METHOD OF USING THE SAME

Doyle A. Moore, R.R. 2, P.O. Box 207, Worthington, Minn. 56187, assignor to Bedford Industries, Inc., Worthington, Minn.

Filed Apr. 21, 1976, Ser. No. 678,923
Int. Cl.[2] B63H *75/18*
U.S. Cl. 242—71.9 **9 Claims**



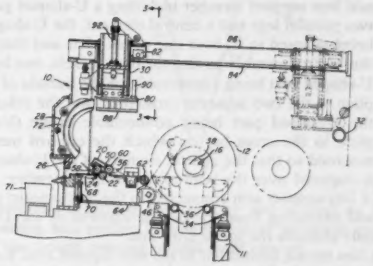
1. A reel adapter for supporting a coil of tie material, said adapter comprising a tubular body member generally in the form of a cylinder, a flange member located at each end of the tubular body member, the flange members being parallel and oriented normal to the axis of the tube, fastening means for removably securing at least one of the flanges on the tube so that the coil of tie material can be placed on the adapter and the removable flange replaced and said adapter having means thereon for engaging the wound coil of tie material to the adapter to prevent rotation of the tie material on the adapter, said tube comprising an expandable collet having a plurality of longitudinally extending circumferentially spaced segments with notches between them, the segments being free at one end and integrally connected at the other end and a collet expanding means operatively associated with the free ends of the segments to press the segments outward when the removable flange is moved in the direction of the other flange and the adapter includes a means for retaining the removable flange and collet expanding means thereupon.

4,117,989

METHOD AND APPARATUS FOR COIL HANDLING AT MILL ENTRY

Andrew J. Petros, Oakdale, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.

Filed Aug. 31, 1977, Ser. No. 829,233
Int. Cl.[2] B21C *47/16*
U.S. Cl. 242—78.8 **15 Claims**



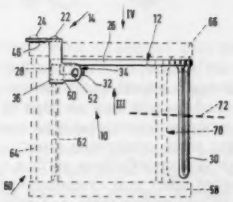
1. In a coil preparation apparatus for supporting and rotating a coil at a first location to pay out strip therefrom for strip preparation and subsequently guiding such strip and coil to a second location at a downstream mill pass line, the improvement comprising: first strip guide means spaced upstream from such a coil for the positive guiding of such strip throughout at least the major vertical portion of the travel thereof from the payout location of such strip from such a coil, which payout location is at a lower peripheral portion of such a coil, to on upper location spaced vertically upwardly from said payout location; said first strip guide means having upwardly extending vertical strip support and guiding portions which are selectively movable transversely of such strip to support and guide such strip at the first coil location and to thereafter release such strip from such support and guiding relationship when such strip is subsequently moved to such mill pass line; and second strip guide means adapted to receive and guide the head end of strip emerging from said first strip guide means at said upper location.

4,117,990

FISHING REEL

Bernard Peter Denny, Blue Hill Farm, Merridale, Natal, South Africa

Filed Feb. 14, 1977, Ser. No. 768,411
Int. Cl.[2] A01K *89/02*
U.S. Cl. 242—84.52 A **6 Claims**



1. A fishing reel attachment for removable attachment to a fishing rod reel having a spool rotatably mounted between parallel spaced cheek plates, said cheek plates being connected together by a plurality of spaced removable cross bars, said attachment comprising:

(a) a control member having a bore therein for pivotably

supporting the control member on one cross bar of the reel;

(b) a control arm connected to the control member and extending transversely from the bore in the control member, said control arm having a curvature corresponding to the curvature of the spool;

(c) a guide part, supported by the control arm and displaced from the bore, for guiding a fishing line wound on the spool;

(d) a brake element mounted on the control member;

(e) a bias support member adapted to be rigidly mounted on the cross bar of the reel on which the control member is supported and an adjacent parallel cross bar of the reel, said bias support member including a U-shaped part with two parallel legs and a central element, the U-shaped part being adapted to fit over one cheek plate and that part of the control member having the bore therein, one leg of the U-shaped part being connectable on the outside of a cheek plate to the two adjacent cross bars, and the other leg of the U-shaped part being connectable inside this cheek plate to the cross bar on which the control member is mounted so that the central element of the U-shaped part is disposed over the bore of the control member;

(f) a bias support arm connected to the bias support member and extending from the central element of the U-shaped part towards the guide part; and

(g) bias means, connected to the bias support arm, for acting between the bias support arm and the control member, said bias means for including a coil spring adapted to act towards the rotational axis of the spool so as to urge the control member to pivot about the cross bar on which the control member is mounted, thereby bringing the brake element into frictional contact with the spool to retard rotation of the spool, so that when the fishing line is taut and the line bears against the guide part, the control member, and thus the brake element, are pivoted about the first cross bar against the action of the bias means.

4,117,991

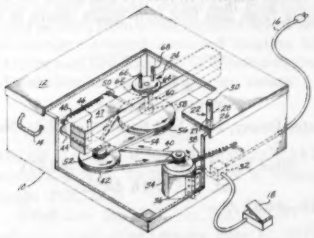
HOSE WINDING MECHANISM

Roy E. Johnson, 1605 S. 2nd St., Shelton, Wash. 98584

Filed Mar. 9, 1977, Ser. No. 775,910

Int. Cl.[2] B65H *75/40*

U.S. Cl. 242—86 **7 Claims**



2. A mechanism for winding hose and the like comprising: a flat rolling table having a smooth outer surface; a hose guide means attached to and located near an edge of said table; a wind plate means, mounted for rotation in an opening near the center of said rolling table, comprising a plate mounted substantially flush with said smooth outer surface of said rolling table, a pair of spaced apart pins extending outwardly from said outer surface of said rolling table, and means for attachment of a hose end; electrical motor means for supplying power to rotate said wind plate means; manually operated control means for controlling said electrical motor means; and a pivotally mounted intermediate speed reduction means, operably connected between said electrical motor means and said wind plate means, for substantially reducing the speed of rotation of said wind plate means to a range suitable for winding of hose and the like, said intermediate speed reduction means comprising a rotatable mounting plate, large and small pulleys fixed together and connected to said mounting plate for free rotation with respect thereto, and spring biasing means, attached to said mounting plate, for urging said large and small pulleys away from each of said motor means and said winding plate means.

4,117,992

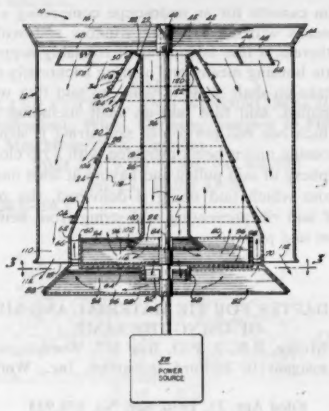
VERTICAL LIFT DEVICE

Charles K. Vrana, P.O. Box 686, La Belle, Fla. 33935

Filed Oct. 28, 1976, Ser. No. 736,444

Int. Cl.[2] B64C *29/02*

U.S. Cl. 244—23 C **9 Claims**



1. A vertical lift device comprising,

a main cylindrical housing defining a vertically extending tunnel having open top and bottom ends,

a tube, extending axially through the main control height of said tunnel and having upper and lower open ends,

an axially disposed main truncated hollow cone in said tunnel having a relatively small open upper end and an enlarged open lower end, said cone being disposed about said tube, defining an inner conical chamber between an inside wall surface of said cone and an outside wall surface of said tube, said cone and tube open upper ends being fixed relative to each other inwardly of said tunnel open top end,

means to fixedly support said tube and cone in said tunnel,

a drive shaft, extending axially upwardly through said tube,

a downdraft producing propeller disposed in said tunnel open top end and being fixed to said drive shaft above said tube open upper end,

fan means disposed in said enlarged open lower cone end and being fixed to said drive shaft,

a power source operably connected to an outwardly extended end of said drive shaft to operate said propeller and said fan means, said propeller thereby creating an air stream having a first air stream portion passing downwardly through said tunnel outwardly of said cone and out through said tunnel open bottom end, to create first lift forces and a second air stream portion passing downwardly through said tube.

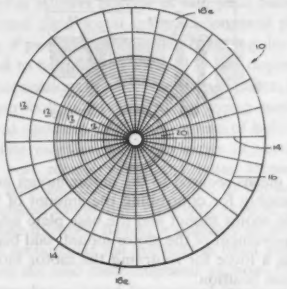
said fan means having blade means positioned to intercept said second air stream portion at said tube open lower end and to divert it upwardly into said conical chamber to create second lift forces.

4,117,993

PARACHUTE CANOPY

Lorenz A. Palm, Ridgeway, and David B. Webb, Fort Erie, both of Canada, assignors to Irvin Industries Canada Ltd., Fort Erie, Canada

Filed Jul. 25, 1977, Ser. No. 818,418
Int. Cl.[2] B64D *17/12*
U.S. Cl. 244—145 **8 Claims**



1. A parachute having a canopy adapted to reduce opening forces at high speed without substantially increasing opening time at low speed, the canopy comprising:

a plurality of circumferential rings extending from the crown to the skirt,

a plurality of substantially trapezoidal panels arranged in each of said circumferential rings,

at least a portion of said panels being formed of woven stretch fabric, said fabric in said panels having stretch yarn in a circumferential direction and non-stretch yarn in a radial direction so that the stretch characteristic of said stretch fabric panels is developed solely in a circumferential direction,

said stretch fabric panels being located in at least two adjacent ones of the innermost ones of said rings.

each of said panels in the one of said circumferential rings at said skirt being formed of non stretch fabric, and

circumferentially extensible stitching means joining adjacent stretch fabric panels along their circumferential edges,

said stretch fabric panels having a characteristic curve of air permeability versus dynamic air pressure that is concave up over a predetermined range of dynamic air pressure.

4,117,994

PARACHUTE WITH CANOPY OPENING ASSIST AND OPENING CONTROL

David B. Webb, Fort Erie, Canada, assignor to Irvin Industries Canada Ltd., Fort Erie, Canada

Filed Jun. 21, 1977, Ser. No. 808,605
Int. Cl.[2] B64D *17/08*
U.S. Cl. 244—152 **19 Claims**

1. A parachute having rapid initial opening and controlled opening shock comprising:

a main canopy having a skirt portion

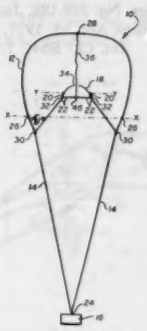
a plurality of support lines connected to said main canopy, each of said support lines having an end connected to a common confluence point,

an auxiliary canopy positioned within said main canopy when the parachute is in a squidded state,

the skirt of said auxiliary canopy being positioned a substantial distance above said skirt of said main canopy in said squidded state, and

a plurality of reefing lines, each of said reefing lines being fixidly connected to a respective one of said support lines at a point remote from said confluence point and below said canopy skirt portion,

said auxiliary canopy being connected to said reefing lines, said point at which said reefing lines are connected to said support lines being sufficiently close to said skirt of said main canopy so that, during inflation, the force exerted by said auxiliary canopy on said reefing lines will provide



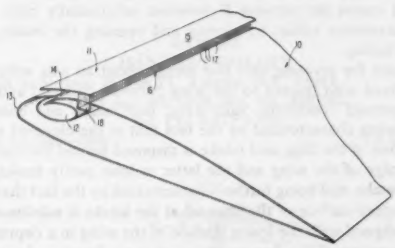
substantial reefing of said canopy and so that on initial opening, said reefing lines will control the shape and size of the mouth opening of said main canopy.

4,117,995

AIRCRAFT WING LIFT AUGMENTATION DEVICE

Thomas M. Runge, 2501 Galewood Pl., Austin, Tex. 78703

Filed Feb. 28, 1977, Ser. No. 772,669
Int. Cl.[2] B64C *21/04*
U.S. Cl. 244—207 **5 Claims**

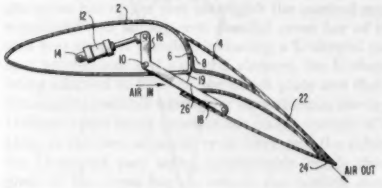


5. In an aircraft wing, an internal duct extending longitudinally of the wing near and rearwardly of the wing leading edge and having an outlet slit opening through the top of the wing for directing air from the duct rearwardly across the top of the wing, said duct adapted to receive jet engine air diverted thereto, a slat adapted in a retracted position to cover said outlet slit and to lie flush on the wing, said slat when extended above the wing forming a passage between the slat and wing for the rearward flow of a high velocity stream of air discharging through said slit for augmenting wing lift, an air laminar flow inducing means on the bottom of said slat, said wing having a top recess adapted to receive said means when said slat is retracted, and means on said wing coupled with said first-named means and slat to retract them and allowing extension of the slat and first-named means above the wing upper surface under the influence of said high velocity air stream.

4,117,996
VARIABLE AERODYNAMIC COMPRESSION FLAPS

Irving R. Sherman, 8045 E. Douglas Ave., Apt. 205, Wichita, Kans. 67207

Continuation of Ser. No. 589,188, Jun. 23, 1975, abandoned. This application Apr. 15, 1977, Ser. No. 787,846
Int. Cl.[2] B64C 3/28
U.S. Cl. 244—212 4 Claims



1. In an airplane

a wing having a lower surface which in horizontal flight of the airplane extends generally horizontally,

trailing edge unpowered geometric aerodynamic compression flap means pivoted on said wing, means in said flap means providing a rearwardly convergent channel of fixed geometry for geometrically compressing exterior air, defined on its upper and lower sides by upper and lower predominantly convergent surfaces extending therethrough for at least most of the entire width thereof from front to rear and having an intake adjacent the forward end of the flap means, and an always open exit of fixed depth in a rearward portion of the flap means wherein the compression ratio K of said channel is varied and determined according to the formula

$$K = to/tj$$

where

to = depth of intake

tj = depth of exit,

and means for varying K between substantially zero and maximum values by closing and opening the intake, including

means for pivoting said flap means about an axis which is fixed with respect to the wing between elevated and depressed conditions, said wing, flap means and channel being characterized by the fact that in the elevated position of the flap, said intake is disposed behind the trailing edge of the wing and the latter at least partly masks the intake, and being further characterized by the fact that the upper surface of the channel at the intake is substantially aligned with the lower surface of the wing in a depressed position of the flap means, so that air flowing along the lower surface of the wing enters the channel intake with no substantial angular change in direction at said entry,

and characterized further than in the depressed position of the flap means the exit is directed downwardly and rearwardly with respect to the lower surface of the wing.

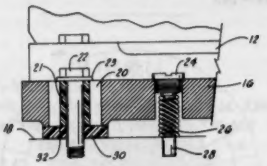
4,117,997
MOTOR ISOLATION MOUNT FOR DISK DRIVES

Louis G. Gitzendanner, Oklahoma City, Okla., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 462,460, Apr. 19, 1974, abandoned. This application Jun. 26, 1975, Ser. No. 590,455
Int. Cl.[2] F16F 15/00
U.S. Cl. 248—20 7 Claims

1. In a data storage apparatus having a linear magnetic motor assembly, a movable coil attached to the linear magnetic motor assembly, an elongated base plate assembly, and a motor mount secured to the base plate assembly by bolt means, the improvement comprising:

(a) means for allowing movement of the motor mount away from an equilibrium position on the base plate assembly when the movable coil is actuated limited to a direction parallel to the direction of travel of the movable coil; and

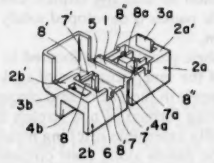


(b) biasing means secured to the motor mount and the base plate assembly for controlling the amount of friction between the motor mount and the base plate assembly during the movement of the motor mount, said biasing means providing a force for returning the motor mount to said equilibrium position.

4,117,998
RETAINING DEVICE FOR CORDS

Yoshiaki Notoya, Zushi, Japan, assignor to Nifco, Inc., Tokyo, Japan

Filed Dec. 16, 1977, Ser. No. 861,158
Claims priority, application Japan, Jan. 26, 1977, 52/7273[U]
Int. Cl.[2] F16L 3/22, 5/00
U.S. Cl. 248—56 3 Claims



1. A retaining device for cords, which device comprises a pair of retainer blocks formed integrally and connected to each other through the medium of a thin-walled hinge portion, one of said two retainer blocks being provided in the face continuing into said hinge portion with a plurality of paths for admitting cords of differing cross sections and the other retainer block being provided in the face continuing into said hinge portion with push pieces adapted to protrude into said paths and push down the cords to be laid through said paths. and wherein one of the two paths formed in one of the two retainer blocks is obstructed by one of said push pieces provided on the other retainer block and the other path is obstructed by a rib protruding in the direction of the width of the path, whereby a cord laid through either of the paths is forced to assume an arcuately bent shape.

4,117,999
FURNITURE LEG EXTENDERS

Robert U. Gessler, Wilton, Conn., assignor to Easy Riser, Inc., Wilton, Conn.

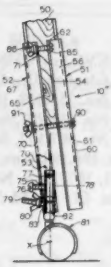
Filed Sep. 12, 1977, Ser. No. 832,647
Int. Cl.[2] F16M 11/20
U.S. Cl. 248—188.2 1 Claim

1. A device for extending the length of the leg on a conventional chair, bed, or other furniture without altering the leg exterior surfaces comprising, in combination:

(a) a first rigid metal integral elongated plate member having

a pair of outer coplanar rectangular flat sections and therebetween a plurality of interconnecting rectangular flat sections in fixed angular relation adapted for vertical positioning to engage and partially surround with an inner side thereof lower outer surface portions of said leg, having a pair of upper bolt receiving holes formed in upper outer edge portions of said coplanar sections, and having a series of vertically spaced lower bolt receiving support holes formed along a vertical line centrally of said middle sections in a lower portion of said plate member;

(b) a second rigid metal integral elongated plate member having a pair of outer coplanar rectangular flat sections adapted to be disposed parallel to and opposite the outer coplanar sections of said first plate member, having a pair of upper bolt holes located for being mated with and disposed opposite to the upper pair of bolt holes of said first plate member, having a series of vertically spaced lower bolt receiving support holes located for being mated with and disposed opposite to the series of vertically spaced lower bolt receiving support holes of said first plate member, having a plurality of interconnecting middle rectangular flat sections in fixed angular relation between the said outer coplanar sections of said second plate member adapted for vertical positioning to engage and partially surround with an inner side thereof opposite lower outer surface portions of said leg;



(c) stem-receiving means mounted on an inner lower central portion of one of said plate members and adapted to receive the stem portion of a floor contacting device, said stem-receiving means comprising a generally vertically disposed stem-receiving tube member pivotally mounted within a said lower portion of a selected one of said plate members and including screw adjustment means in such selected plate member to fix and secure the angular relation of said tubular stem member with respect to the said selected plate member on which the same is mounted thereby enabling said device to adapt to an outwardly angled leg for providing vertically positioned stem support therefor;

(d) a pair of upper bolt members adapted to be mounted in said upper bolt receiving holes for clamping the upper outer coplanar sections of said plate members together to secure the upper inner portions of said plate middle sections against said leg;

(e) a single lower bolt member mounted in a selected set of said lower bolt receiving holes and being adapted to support the bottom of said leg thereon and clamp together the lower portions of said middle sections of of said plate members about said leg; and

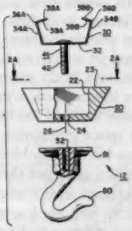
(f) a floor-engaging device having a stem mounted in said stem-receiving means.

4,118,000

APPARATUS FOR SUPPORTING A MEMBER FROM A DROP-TILE CEILING

David Lester Campbell, Anchorage, Ak., assignor to George C. Ballas, Houston, Tex.

Filed Apr. 7, 1977, Ser. No. 785,444
Int. Cl.[2] **A47B** *96/06*
U.S. Cl. 248—228 **12 Claims**



1. Apparatus for supporting a member from a channel beam of a drop-tile ceiling comprising:

a decorative escutheon having a recess therein and having an opening therethrough communicating with said recess;

a resilient element for grasping the channel beam, said grasping element having a first and a second arm each bent at a joint toward the other to define an inwardly extending flange substantially perpendicular to its associated arm, said grasping element being moveable within said recess from a first, open, position to a second, grasping, position, said grasping element having a dimension between the ends of the flanges such that, in said first position, said grasping element is sized to span the width dimension of the channel beam, said flanges of said grasping element being dimensioned such that, in said second position, the grasping element is in grasping engagement with the channel beam so that said joint in each of said arms is contracted against the edges of the channel beam; and,

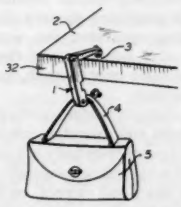
closure means extending through said opening in said escutheon and connected to said grasping element for moving said grasping element from said first position to said second, grasping, position.

4,118,001

HANDBAG HOLDER

Alvin A. Serkez, 26 Tea Pl., Tappan, N.Y. 10983

Filed Apr. 10, 1978, Ser. No. 895,263
Int. Cl.[2] **A47F** *5/00*
U.S. Cl. 248—308 **9 Claims**



1. A handbag holder of the type having a support member connected to a hook member which is used by resting the support member near an edge of a substantially horizontal support surface, with the hook member extending over the edge where it may hold a hand strap associated with the article to be held thereby, wherein the improvement comprises a body in the shape of a long box with a first end and a second end, two side walls having a first pair of holes through said side walls and opposite one another within and adjacent said first end and a second pair of holes through said side walls and

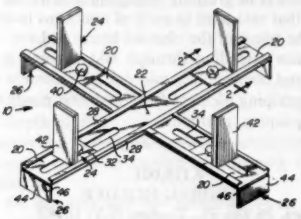
opposite one another within and adjacent said second end, and a back wall extending from said first end to said second end, defining a front opening; a first pivot pin mounted through said first pair of holes; a second pivot pin mounted through said second pair of holes; an upper support arm which is of a size of fit flush within the two side walls of the body and of a fixed length between one half and two thirds of the length of the body, said support arm having a first aperture through which said first pivot pin fits when said support arm is assembled within said body adjacent said first end, said support arm having a first shoulder which contacts said corresponding first end to prevent said support arm from being opened out from its closed position within said body more than a predetermined angular amount; and a lower hook arm which is of a size to fit flush within the two side walls of the body and of a length such that it fits within the space remaining in said body after said upper support arm has been assembled within said body, said hook arm having a second aperture through which said second pivot pin fits when said hook arm is assembled within said body adjacent said second end, said hook arm having a second shoulder which contacts said corresponding second end to prevent said hook arm from being opened out from its closed position within said body more than a predetermined angular amount, whereby the hook arms close flush into the side walls of said body to provide a compact, self-contained box-like configuration for carrying said handbag holder.

4,118,002

APPARATUS FOR CONNECTING A VACUUM CLEANER AND SOLUTION TANK AS A CLEANING SOLUTION-EXTRACTION CLEANER

Robert N. Bartlett, 2310 S. Holly St., Denver, Colo. 80222

Filed Jun. 6, 1977, Ser. No. 803,453
Int. Cl.[2] F16M *13/02*
U.S. Cl. 248—311.1 R **2 Claims**



1. In apparatus for connecting a wet dry vacuum cleaner in an essentially vertically-spaced relationship with a cleaning solution tank for combined use as a cleaning solution extraction-type cleaning apparatus, the wet-dry vacuum cleaner having a body with sidewalls and the solution tank having sidewalls and an open upper mouth, an improved connecting apparatus comprising:

at least four elongated arm members joined together at a common point and extending horizontally outward from the common point essentially in a single plane, each of said arm members extending longitudinally from the common point to an outer end thereof, each of said arm members being equally angularly spaced with respect to both of its adjoining arm members, each of said arm members including two transversely spaced apart and longitudinally extending U-shaped edges, each of the U-shaped edges extending longitudinally substantially along the total length of each arm member from the common point to the outer end thereof, the U-shaped edges opening toward one another on an upper vertical side of each arm member, each of said arm members further including means defining a slot extending substantially parallel to and intermediate of the U-shaped edges along said arm members;

one first bracket member operatively associated with each arm member, each first bracket member having a base portion and an upstanding projection portion, the upstanding projection portion extending substantially perpendicularly with respect to the base portion, the base portion of each first bracket member being operatively transversely received within the transversely spaced-apart width defined by the transversely spaced-apart U-shaped edges opening toward one another, the receipt of the base portion within the space between the U-shaped edges operatively allowing only longitudinal movement of said first bracket member along the longitudinal dimension of the arm member with which it is associated, the upstanding projection portion contacting the sidewalls of one of either of said vacuum cleaner body or said solution tank;

fastening means operatively connected to the base portion of each said first bracket member and extending into the slot defined in said arm member with which the first bracket member is associated, said fastening means being selectively operative to retain said base portion against longitudinal movement along said arm member; and

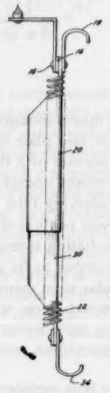
one second bracket member rigidly attached at the outer end of each arm member, each second bracket member having a projection portion extending essentially perpendicularly and vertically downward with respect to the longitudinal dimension of said arm member, the projection portion of said second bracket member contacting the sidewalls of the other one of either of said vacuum body or said solution tank.

4,118,003

RADIO ANTENNA MOUNTING DEVICE

Paul E. Dillow, 11290 Glennon Dr., Denver, Colo. 80226

Continuation of Ser. No. 753,239, Dec. 22, 1976, which is a continuation of Ser. No. 614,297, Sep. 17, 1975, which is a continuation of Ser. No. 507,157, Sep. 18, 1975, which is a continuation of Ser. No. 198,194, Nov. 12, 1971. This application Nov. 21, 1977, Ser. No. 853,969
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—539 **7 Claims**



1. Radio antenna mounting device which comprises:

a pair of longitudinally opposed telescoping members extending along a common longitudinal axis and having corresponding outer extremities longitudinally remote from each other and corresponding inner extremities operating one within the other for varying the overall longitudinal dimension thereof and the corresponding overall linear distance between such outer extremities along the longitudinal axis to accommodate wide range interchangeable attachment thereof between longitudi-

nally spaced apart clampable support surfaces of differing longitudinal spaced apart dimensions;

a corresponding pair of longitudinally opposed clamp members of selective fixed longitudinal dimension extending along the longitudinal axis and having corresponding inner ends longitudinally adjacent to and stationarily fixed to the outer extremities of the telescoping members and corresponding outer ends longitudinally remote from each other and defining clamping surfaces extending crosswise of the longitudinal axis in opposed facing relation to each other, said outer ends being longitudinally remote from the corresponding outer extremities of the telescoping members and said clamp members operatively extending longitudinally outwardly beyond such extremities a selective fixed cumulative linear distance corresponding to the combined selective fixed longitudinal dimensions of such opposed clamp members for common clamping coaction of the clamping surfaces to such clampable support surfaces and thereby concomitantly increasing the range of such interchangeable attachment beyond that of the overall longitudinal clamping dimension of the telescoping members and the corresponding overall linear distance between such outer extremities to the extent that such selective cumulative linear distance exceeds such corresponding overall linear distance between such outer extremities, and

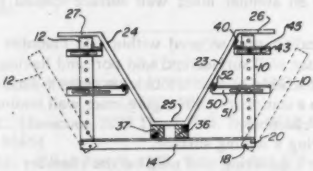
biasing means operatively interposed longitudinally inwardly of the clamping surfaces of the clamp members for biasing the clamp members longitudinally toward each other for such clamping coaction.

4,118,004

CONCRETE BEAM FORM

Samuel Clyde Scott, 2419 Walnut St., Denver, Colo. 80205

Filed May 16, 1977, Ser. No. 797,196
Int. Cl.[2] E04G *13/04*
U.S. Cl. 249—50 **5 Claims**



1. A light weight form for concrete beams comprising:

(a) a plurality of yokes each in the shape of a general U-shaped metal member, having upright legs and at least one horizontal member and said yokes spacedly arranged along the length of the form;

(b) an upper, adjustable metal arm extending generally horizontally inwardly on each leg of each yoke, arranged for adjustment inwardly and outwardly;

(c) a lower, adjustable metal arm extending generally horizontally inwardly on each leg of each yoke below the associated upper arm, and each lower arm arranged for adjustment inwardly and outwardly;

(d) a longitudinal stringer mounted on the inner ends of the upper arms providing opposed longitudinal braces;

(e) a longitudinal stringer mounted on the inner ends of the lower arms providing opposed longitudinal braces;

(f) at least two continuous, longitudinal braces resting and mounted on the horizontal members of said yokes; and

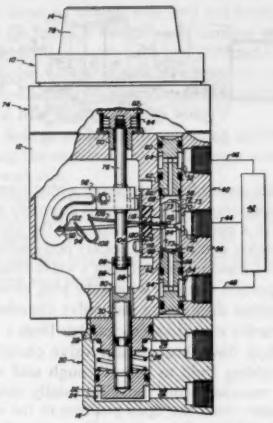
(g) a continuous beam forming sheet mounted in said yokes in upright position on each side with each sheet fastened to the respective stringers and a continuous generally horizontal beam forming sheet secured to the horizontal longitudinal braces with said side sheets forming a tight joint with said generally horizontal sheet.

4,118,005

TIMING DEVICE FOR FLUID VALVE

Charles P. O'Neil, Milwaukee, Wis.; Adam Smorzaniuk, West Millington, N.J., and James O. Young, Waukesha, Wis., assignors to Amerace Corporation, New York, N.Y.

Division of Ser. No. 658,773, Feb. 17, 1976, Pat. No. 4,068,682.
This application Sep. 9, 1977, Ser. No. 831,834
Int. Cl.[2] F16K *1/163, 11/04*
U.S. Cl. 251—75 **7 Claims**



1. A fluid valve for use in a timing device in which the fluid valve is actuated upon the expiration of a prescribed timed interval following a given event, said fluid valve comprising:

a valve body having a chamber and a wall between the chamber and the exterior of the valve;

first and second passages communicating with the chamber;

a shuttle in the chamber movable between a first position, wherein the shuttle closes communication between one of said first and second passages and the chamber, and a second position wherein communication is open between both said first and second passages and the chamber;

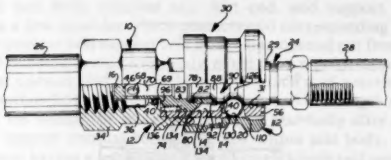
a snap-action mechanism isolated from the fluid valve by the wall between the chamber and the exterior of the fluid, said snap-action mechanism including a first lever extending through the wall, said first lever having a first end engaging the shuttle within the chamber, a second end outside the chamber and an intermediate portion through the wall; and

a member of resiliently flexible material in said wall engaging the intermediate portion of said first lever to enable swinging movement of the first lever relative to the wall, said member of resiliently flexible material maintaining a seal between the chamber and the exterior of the valve at the location where the intermediate portion passes through the wall whereby said snap-action mechanism is isolated from the fluid valve in a fluid-tight manner; and wherein the snap-action mechanism includes a second lever having first and second ends; pivotal means mounting the second lever adjacent the first end thereof for pivotal movement relative to the frame and relative to the first lever; a snap-action spring coupling the first and second levers adjacent the second ends thereof; and a trip means engaging the second end of the second lever, the trip means being adaptable for movement thereof to effect displacement of the second lever and the snap-action spring relative to the first lever, the displacement of the second lever and the snap-action spring causing a swinging movement of the first lever and movement of the shuttle between the first and second position in response to the swinging movement of the first lever.

4,118,006
SOCKET ASSEMBLY

James F. Norton, Berea, and Richard J. Silagy, Parma, both of Ohio, assignors to The Hansen Manufacturing Company, Cleveland, Ohio

Filed Dec. 1, 1976, Ser. No. 746,393
Int. Cl.[2] F16L *37/28*
U.S. Cl. 251—149.6 38 Claims

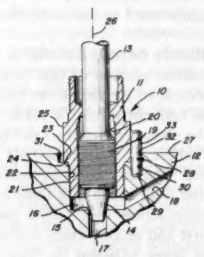


1. A socket assembly for receiving a plug element to connect a conduit associated with said socket assembly in fluid communication with a conduit associated with the plug element, said socket assembly comprising a socket body adapted to be connected with a conduit and defining a valve chamber having an outer end portion through which the plug element is inserted, a valve member disposed in said valve chamber and movable axially inwardly in said valve chamber from a closed position blocking fluid flow through said valve chamber to an open position enabling fluid to flow through said valve chamber, said valve member being movable axially outwardly in said valve chamber from the open position to the closed position, biasing means for applying an axially outwardly directed biasing force to said valve member urging said valve member toward the closed position, and locking means for engaging said valve member and holding it against axially inward movement under the influence of an axially inwardly directed force which is greater than said biasing force when said valve member is in the closed position and for engaging the plug element and holding it against axial movement when said valve member is in the open position.

4,118,007
VALVE STRUCTURE

John N. Scapes, Schaumburg, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 17, 1977, Ser. No. 778,370
Int. Cl.[2] F16K *31/44*
U.S. Cl. 251—223 11 Claims



1. In a valve having a body provided with a surface portion and a recess having a female thread and opening outwardly toward said surface portion, a bonnet having a male threaded inner end threaded to said female thread in said recess, and an outer tool engaging portion having a chordal flatted surface, and cooperating valve means carried by said body and bonnet for selectively controlling fluid flow through the valve, the improvement comprising:

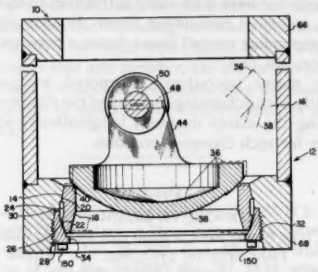
means defining an annular, radially enlarged outer end of said recess opening through said surface portion, at least a portion of said flatted surface of the bonnet being disposed within said outer end of the recess; and

a retainer installed in said enlarged outer end of the recess with said bonnet threadedly mounted to the body, said retainer being secured to said body and extending fully between said flatted surface and the body at the periphery of said annular outer end of the recess, whereby said body effectively backs up the retainer against radial displacement by the bonnet to effectively positively prevent further rotation of the bonnet in said recess thread thereby firmly locking the bonnet in the mounted disposition.

4,118,008
ROTARY VALVE

Edward B. Myers, Oreland, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 549,041, Feb. 11, 1975, abandoned.
This application Oct. 22, 1976, Ser. No. 735,107
Int. Cl.[2] F16K *25/00, 5/06*
U.S. Cl. 251—298 6 Claims



4. A rotary fluid valve comprising

a body containing a valve chamber having a fluid port and having an annular inner wall surface spaced from said port,

a rigid sealing ring secured within said chamber between said inner wall surface and said port and having an inner annular seating surface which converges toward said port to form a stationary converging inner wall seating portion of said chamber,

a lug having a seating surface,

means for supporting said plug on the chamber side of said port for rotation about an axis which is radially offset with respect to the axis of said port and said sealing ring,

a moveable annular seat ring located in said chamber between said supporting means and said sealing ring, said seat ring having an outer annular arcuate seating surface engaging said converging seating surface of said sealing ring, having an inner annular seating surface facing said supporting means, and having a second outer annular arcuate surface engaging said inner wall surface of said chamber, and

means for rotating said plug about its said axis to cause said seating surface of said plug to engage said inner seating surface of said seat ring and to move said seat ring into the position in which said inner seating surface of said seat ring is moved into sealing engagement with said seating surface of said plug, and said outer seating surface of said seat ring is simultaneously moved into sealing enagement with said seating surface of said sealing ring, said moving of said seat ring causing said second outer surface of said seat ring to move on

said inner wall surface of said chamber and said engaging second outer surface of said seat ring having shapes which cooperate to cause said inner wall surface to guide said movement of said seat ring and to limit the movement of said seat ring in the direction away from said sealing ring

to prevent the displacement of said seat ring to an inoperative position.

4,118,009

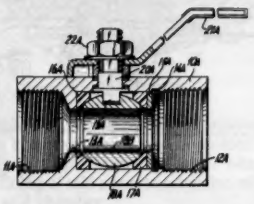
SINTERED BALL VALVE

William J. Chmura, Southington, Conn., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 503,279, Sep. 5, 1974, Pat. No. 4,026,657. This application Mar. 3, 1977, Ser. No. 774,024

Int. Cl.[2] **B21D** *53/10;* **B21K** *1/02;* **F16C** *11/06;* **F16D** *1/12*

U.S. Cl. 251—315 **3 Claims**



1. A ball valve comprising a cooperating element with a curved surface held substantially in contact with a spherically conforming truncated ball element formed from sintered powder metal blank to permit relative motion between said elements, said ball element having a porous structure and having a bore passing therethrough,

substantially the entire spherical surface of said ball element being characterized by a mechanically worked surface of high density of at least about 95% of the theoretical density of said metal with the pores at the surface thereof substantially closed,

the density of said spherical ball element in cross section decreasing inwardly from a highly dense zone adjacent said spherical surface to a porous zone of lower density below said dense zone and extending to the bore, the average density of said porous zone ranging from about 70% to less than 95% of the theoretical density of said metal.

4,118,010

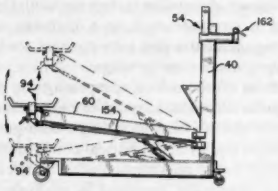
MULTI-PURPOSE LIFTING AND MOUNTING ASSEMBLY

Russell C. Hanscom, 3027 Diss/ P.O. Box 1822, Santa Maria, Calif. 93454

Filed Jan. 9, 1978, Ser. No. 868,175

Int. Cl.[2] **B66F** *5/02*

U.S. Cl. 254—124 **8 Claims**



1. A lifting and mounting apparatus comprising:

a base frame;

an elongated upright member having a bottom portion connected to said frame;

first support means located on the base frame proximate said bottom portion;

second support means located on the upright member above said bottom portion and upper pivot connection means located about the top portion of said upright member;

a lifting beam having an attachment end portion and a pivot end portion adapted for connection to said upright member wherein said attachment end portion includes a cradle means adapted to be releasably connected thereto;

said cradle means comprising a

pivot rod extending beyond the end of the attachment end portion in a direction generally coextensive with the longitudinal axis of said lifting beam interconnecting said cradle with said attachment end portion;

a carriage member comprising an elongated beam extending transversely of said rod and mounted thereon for rotation about its normal axis, said rod freely extending through the carriage member to a terminal end having a first bracket immovably attached thereto;

second bracket means immovably attached to said carriage member in a manner coextensive with and offset from said first bracket means; and,

adjustable linkage means interconnecting said brackets for regulating the angularity of said carriage member about said normal axis;

said lifting beam further including pivot connection means located intermediate of said end portions; and,

a jack unit adapted to be secured to said first or second support means and said pivot connection means for raising and lowering said beam.

4,118,011

LIFT MECHANISM WITH PLATFORM LOCKING DEVICE

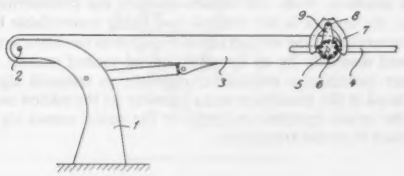
Henning Falck Schmidt, Rasmus Rask Alle 37, DK-5000 Odense, Denmark

Filed Apr. 5, 1977, Ser. No. 784,860

Claims priority, application Denmark, Apr. 5, 1976, 1618/76; Oct. 19, 1976, 4697/76

Int. Cl.[2] **B66F** *17/00*

U.S. Cl. 254—124 **3 Claims**

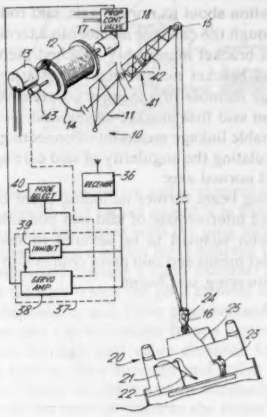


1. A lift mechanism comprising a lift arm, a platform pivoted to the lift arm whereby horizontality of said platform can be maintained irrespective of the position of said lift arm and a locking mechanism operative between said lift arm and said platform, said locking mechanism comprising first and second cooperative locking devices carried by the lift arm and the platform respectively, one of said locking devices including a freely pivoted member and the other of said locking devices including a fixed locking member complimentary to said pivoted member, said pivoted member being free from engagement with said fixed locking member when said platform is horizontal and being adapted to swinging into releasable locking engagement with said fixed locking member when said platform moves from a horizontal position to prevent further movement of said platform from the horizontal position.

4,118,012
LOAD TRANSFER

Andrew Guy Kerr, Edinburgh, Scotland, and Robert Arthur Morley, Southport, England, assignors to Ferranti Limited, Hollinwood, England

Filed Feb. 25, 1977, Ser. No. 772,253
Claims priority, application United Kingdom, Feb. 28, 1976, 07938/76
Int. Cl.[2] B66D *1/48*
U.S. Cl. 254—173 R **9 Claims**



1. Control means for controlling the vertical motion of a hook assembly of a crane carried by the first of two relatively movable stations comprising transducer means carried by the hook assembly operable to generate a signal related to deviation from a desired vertical separation between the second station and the hook assembly, and servo means responsive to an error signal received from the transducer means to cause the hook assembly to be raised or lowered by the crane to restore the desired vertical separation, the transducer means including a control cord extending therefrom to the section station, the transducer being arranged to provide no error signal when the control cord has a predetermined value of tension therein and an error signal operative to cause raising of the hook assembly when the value of the tension is less than the predetermined value and an error signal operative to cause lowering of the hook assembly when the tension exceeds the predetermined value, the tension in the control cord being controllable both by the motion of the second station relative to the hook assembly and manually by an operator on the second station, and further including a transmitter operable to transmit signals produced in the transducer and a receiver on the station carrying the crane operable to apply to the servo means signals received from the transmitter.

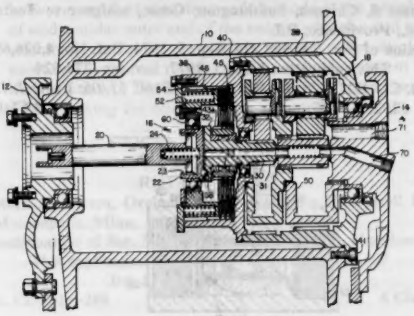
4,118,013
SELF-ENERGIZING WINCH BRAKE AND DRIVE

Sommerville Grant Christison, Delta; John Edwin Magnuson, Surrey, and Wing Chong Tham, Nanaimo, all of Canada, assignors to PACCAR Of Canada, Ltd., Ste-Therese, Canada

Filed Mar. 14, 1977, Ser. No. 776,844
Int. Cl.[2] B66D *1/08*
U.S. Cl. 254—187.5 **8 Claims**

5. A self-regulating brake mechanism for a hoisting winch of the type having a drum for supporting a load, a reversible input shaft driven by a motor, an output drive coupled to the drum, and brake means for locking the drum against lowering when a load is raised and for controlling the speed of the drum when a load is lowered, including spring means for normally engaging said brake means with a set maximum braking force, the improvement comprising:

said output drive including an output shaft and a drive train, one-way clutch means in said drive train for providing free-running movement of the drum in a hoisting direction while the brake remains fully engaged by bypassing said brake means in response to rotation of the input shaft in said hoisting direction but locked to said brake means

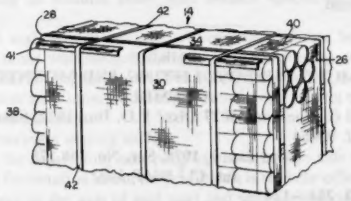


when the output shaft is rotated in the opposite lowering direction, and brake release means operatively associated with said brake means and with said input shaft for releasing the brake means by withdrawing said spring means braking force in direct response to the torque of the input shaft in the opposite lowering direction.

4,118,014
VEHICULAR IMPACT ABSORPTION SYSTEM

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Albert C. Knoell, La Crescenta, and Abraham H. Wilson, Sherman Oaks, both of Calif.

Filed Aug. 19, 1977, Ser. No. 826,204
Int. Cl.[2] E01F *15/00*
U.S. Cl. 256—1 **5 Claims**



1. In an impact absorption system particularly suited for use in shielding a structure such as a highway abutment from impacting engagement with a moving mass, such as an automobile, the improvement comprising:

A. a modular crash cushion comprising one of a plurality of contiguous cushions adapted to be positioned within the path of a moving mass including a contiguous plurality of collapsible bodies of cylindrical configuration comprising voided beverage cans formed of an alloy consisting essentially of aluminum arranged in multiple tiers with the longitudinal axes thereof extended in substantial parallelism with the path of the moving mass, each of the bodies disposed internally of the cushion being nested in six-point contact with adjacent bodies, whereby maximum lateral stability is provided therefor;

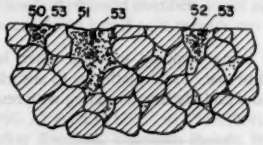
B. a metal hardware cloth mesh enclosure defining an envelope for said cushion, and means for securing the enclosure in place relative to said plurality of bodies including a plurality of transversely related straps; and

C. means for securing the crash cushion against substantial transverse displacement relative to said path.

4,118,015
DEVICE FOR SAMPLING MOLTEN METAL

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Continuation of Ser. No. 639,468, Dec. 10, 1975, abandoned.
This application Apr. 11, 1977, Ser. No. 786,664
Int. Cl.[2] G01N 1/10
U.S. Cl. 266—44 13 Claims

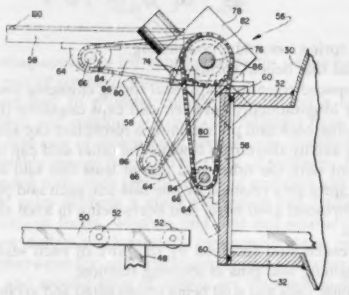


1. A method which comprises steam treating internal porous surfaces of a chamber constructed of molded powdered metal for receiving a sample of molten metal whereby to substantially cause filling of said pores to minimize sticking of a sample obtained in said chamber.

4,118,016
CONTINUOUS HEAT TREATING VACUUM FURNACE

Herbert W. Westeren, Barrington, and Ronald A. Harrison, Cranston, both of R.I., assignors to C.I. Hayes Inc., Cranston, R.I.

Filed Oct. 12, 1976, Ser. No. 731,504
Int. Cl.[2] C21D 1/74
U.S. Cl. 266—130 18 Claims



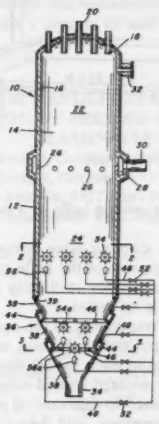
1. A vacuum furnace for continuously introducing and processing work parts through a heating chamber of the furnace for the heat treatment thereof without breaking the vacuum in said heating chamber, comprising a housing in which said heating chamber is located, a loading station including a loading chamber located forwardly of said heating chamber for receiving work parts therein prior to transfer to said heating chamber, a cooling station located rearwardly of said heating chamber and communicating with a discharge station located at the rear of said housing, a first door assembly located at the forward end of said housing for sealing said loading chamber from atmosphere, a second door assembly located between said loading chamber and heating chamber for sealing communication therebetween, a third door assembly for sealing said cooling station from atmosphere, and a fourth door assembly sealing communication between said heating chamber and said cooling station, a series of tracks located in spaced relation at said loading station, heating chamber, cooling station and discharge station, a cart on which said work parts are carried for travel on said tracks, a first transfer means for moving said work cart from said loading station into said heating chamber at predetermined intervals, and a second transfer means operated independently of said first transfer means for removing said work cart from said heating chamber for transfer to said cooling station and for transfer to said discharge station, said first transfer means including an elongated flexible spring that is mounted independent of the door assembly located adjacent thereto and on the end of which a transfer element is secured, gear means engaging said spring for producing linear movement thereof, means for rotating said gear means, and means for urging said spring into intimate engagement with said gear means for effecting a positive drive therebetween.

14. A drive assembly for moving a work cart through the interior of a heat treating furnace, comprising an elongated flexible coil spring, a pulley having an annular groove formed therein in which teeth are disposed in pitched, spaced relation and generally parallel to the axis of said pulley for receiving the coils of said spring in driving relation, means for rotating said pulley for effecting a longitudinal movement of said spring, a pivotally mounted roller having an annular groove that snugly engages said spring for urging said spring into intimate contact with said pulley, and a push member joined to the outermost end of said spring and engaging said work cart for producing a movement thereof as said spring is moved longitudinally, the teeth as formed in the groove in said pulley being located at the lowermost portion thereof, wherein the spring is prevented from riding out of the groove during the longitudinal movement of the spring.

4,118,017
SHAFT FURNACE DESIGN

Luther G. Hendrickson, Churchill Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 2, 1976, Ser. No. 646,137
Int. Cl.[2] C21B 11/02
U.S. Cl. 266—187 2 Claims



1. In a shaft furnace for the direct reduction of oxidic ore including an upstanding refractory lined, metallic shell defining a chamber in which ore is reduced by intimate contact with reducing gas, said shell having ore supply and discharge openings for passing ore by gravity from top to bottom through said chamber and a downwardly convergent transition section adjacent said ore discharge opening, high temperature reducing gas inlet means communicating with said chamber at an intermediate region thereof and effective to pass said high temperature gas in counterflow relation to the flow of ore therethrough, means for introducing cool reducing gas adjacent said ore discharge opening for flow in counterflow relation to said ore, improvement comprising means for regulatably passing said cool reducing gas through each of a plurality of concentrically spaced transverse sections of said shell, said means comprising a transition section including:

(a) a plurality of hollow, conical frustrums disposed in mu-

tual telescoping relation depending from the lower end of said shell;

(b) axially spaced, annular plates interconnecting said frustrums and cooperating therewith to form a plurality of axially spaced annular manifolds of progressively reduced diameter extending about the periphery of said transition section,

(c) circumferentially spaced openings in said plates establishing gas communication between said manifolds and said chamber;

(d) circumferentially spaced partition plates in said manifolds for dividing the same into separate compartments; and

(e) means for independently regulating the supply of cool reducing gas to each of said compartments.

4,118,018

COVER DEVICE FOR CASTING VESSELS, LADLES OR OTHER METALLURGICAL TREATMENT CONTAINERS

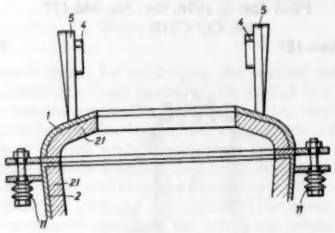
Hans Grüner; Klaus Terjung, both of Duisburg; Wolfgang Sachse, Düsseldorf, and Heinrich-Wilhelm Romerswinkel, Mülheim-Saarn, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 20, 1976, Ser. No. 734,130

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1975, 2548827; Nov. 4, 1975, 2549825

Int. Cl.² F27D *3/00*

U.S. Cl. 266—275 **5 Claims**



1. Cover device for a casting ladle or a metallurgical vessel comprising:

an annular inwardly curving edge portion extending partially over a top opening of the ladle or vessel;

spring biased bolt means for resiliently bolting said edge portion to said ladle or vessel;

a central portion corresponding to the opening of said edge portion and being positioned thereon, said central portion and said edge portions each having fire proof lining;

stop elements rigidly secured to said edge portion; and

a bridle tiltably mounted to said central portion, said bridle having lateral extensions, said lateral extensions being capable of engagement with said stop elements for locking the central portion to the edge portion and for releasing the central portion upon disengagement from the stop elements.

4,118,019

SHOCK ABSORBING PAD WITH KEYED STRUTS

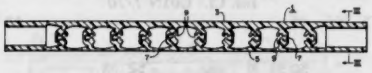
David F. Weir, Sunnyvale, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 1, 1977, Ser. No. 820,675

Int. Cl.² F16F *1/36*

U.S. Cl. 267—153 **6 Claims**

1. A shock absorbing pad having an elongated longitudinal section and comprising a first platform and a second platform disposed generally parallel to said first platform and extending along the length of said section, and a plurality of struts longitudinally spaced connecting said platforms and extending transverse to the longitudinal axis of said section, each of said struts having a notch opening in a direction facing an axis transverse to the longitudinal axis of said section, each said notch having only a single tongue-and-groove portion spaced apart on opposing portions of each said notch, the tongue-and-



groove portions being disposed to mate when large shock loads are applied to one of said platforms to absorb said large shock loads without said platforms rotating with respect to one another.

4,118,020

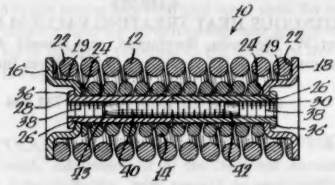
SPRING ASSEMBLY AND METHOD OF ASSEMBLY THEREOF

Allen D. Myers, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 10, 1977, Ser. No. 823,302

Int. Cl.² F16F *1/10, 3/04*

U.S. Cl. 267—168 **8 Claims**



1. A spring assembly, comprising:

at least one helical spring;

two spaced retention caps, said spring engaging and extending longitudinally between said caps coaxially therewith;

two pins, each said pin retaining a respective cap and extending axially therefrom toward the other said cap into abutment with the other said pin, at least one said cap being reciprocably retained by one said pin, each said pin having a threaded axial bore, said bores being in axial alignment; and

a threaded stud received by the bore of each said pin and retaining said pins in abutting relation;

said pins, caps and stud being constructed and arranged with respect to each other so as to be effectively inaccessible to a tool or the like for application of a rotative force tending to disassemble said assembly.

4,118,021

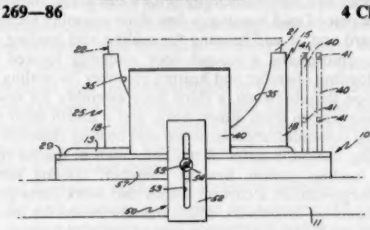
SUPPORT FOR HOLDING SYRIAN BREAD

Donald A. DeLomba, 2 Canna St., Warwick, R.I. 02888

Filed Aug. 15, 1977, Ser. No. 824,277

Int. Cl.² B25B *1/20*

U.S. Cl. 269—86 **4 Claims**



1. A support for holding Syrian bread while being filled with food comprising a base, a pair of similar L-shaped members

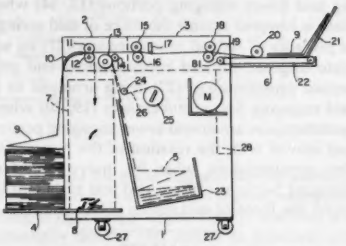
having foot and upstanding arm portions, said foot portions mounted on said base, said upstanding arms provided with recesses facing each other to receive the edge of the bread and said members being spaced to permit the opposite faces of the bread to bulge outwardly between said recesses for filling with food between said faces, plates at flaring angles to said base mounted on said base at either side of said members along the space between said recessed members to act as supports for the opposite faces of said bread as it spreads outwardly thru said spaces.

4,118,022

BURSTING APPARATUS FOR CONTINUOUS FORMS

Wilson Parker Rayfield, Pittsford; Ronald Worden Ferguson, Rochester, and George Mahue Brooks, Pittsford, all of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 8, 1977, Ser. No. 785,896
Int. Cl.[2] B65H *41/00*
U.S. Cl. 270—52.5 **24 Claims**



1. Bursting apparatus for continuous forms comprising:
a first pair of rotating rollers;
a second pair of rotating rollers mounted on a movable carriage and rotating at a velocity different from that of said first pair of rollers, said second pair of rollers being adjustably spaced from said first pair of rollers by a pair of threaded rods, each pair of rollers of said first and second roller pairs defining a nip for gripping and feeding said continuous forms, wherein said first and second pairs of rollers define a substantially horizontal plane of travel therebetween for said continuous forms and wherein said first and second pairs of rollers are disposed such that a plane passing through the axes of one of said pairs of rollers is angularly tilted from the vertical in an opposite rotational sense from a plane passing through the axes of the other pair of rollers such that each said pair of rollers has a nip plane tangent to each roller but skewed with respect to said plane of travel of said forms; and
a bursting blade mounted on said movable carriage for cooperating with preweakened zones on said forms.

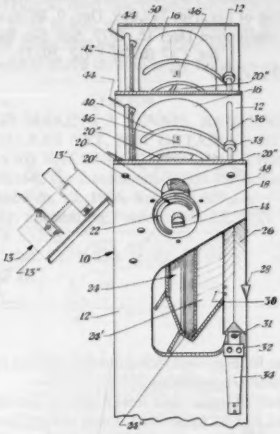
4,118,023

CALIPER STITCH AND TRIM MACHINE

Thomas F. Macke, 525 S. E. 26th Ave., Fort Lauderdale, Fla. 33301

Continuation-in-part of Ser. No. 299,819, Oct. 24, 1972, Pat. No. 3,938,799. This application Apr. 12, 1976, Ser. No. 676,057
Int. Cl.[2] B65H *39/02*
U.S. Cl. 270—54 **7 Claims**

1. A combination of a signature-arranging device and a caliper-stitch and trim machine comprising:
a signature-arranging device positioned at a first position,
a caliper-stitch and trim machine positioned at a second position, said caliper-stitch and trim machine including a caliper means for providing work test standards for measuring the thickness of the signatures positioned at a caliper station, a stitching means positioned at a stitching station downstream of said caliper means, and a trimming means positioned at a trimming station,
a common saddle means in said signature-arraning device to accumulate work from said signature-arranging device to form books and move the books through said caliper means, then through said stitching means, and into at least a portion of said trimming means, and



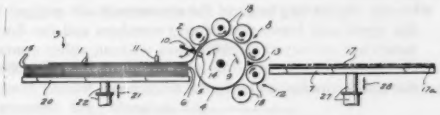
drive means connected to said caliper-stitch and trim machine to reciprocate said common saddle means to carry signatures through said signature-arranging device to and through at least a portion of said caliper-stitch and trim machine.

4,118,024

APPARATUS FOR HANDLING FACING SHEETS FOR THE PRODUCTION OF PRESSED BOARD AND OTHER LAMINATES

Klaus Gerhardt, Rheurdt, Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Germany

Filed Jun. 20, 1977, Ser. No. 808,373
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627810
Int. Cl.[2] B65H *29/24, 29/54*
U.S. Cl. 271—5 **10 Claims**



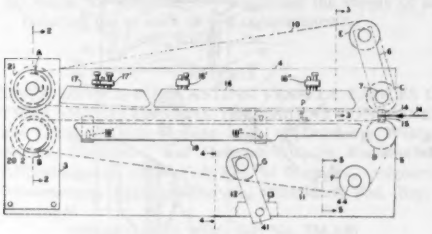
1. A sheet-handling apparatus which comprises:
means for receiving a pile of sheets having a leading edge and a trailing edge;
a drum disposed adjacent said pile and reversibly rotatable about an axis, said drum being formed with a pickup engageable with a portion of a sheet adjacent the leading edge thereof;
a deflector disposed adjacent said drum for guiding a leading edge of a sheet entrained by said drum in one sense of rotation and a trailing edge of a sheet entrained by said drum in an opposite rotational sense away from the periphery of said drum;
an assemby table receiving said sheets from said deflector;
forward pressing means for urging a sheet against the periphery of said drum during displacement of said drum in said one sense; and
reverse pressing means for retaining a sheet against the periphery of said drum upon rotation of said drum in said

opposite sense, whereby said drum is adapted to dispose said sheets selectively in the same orientation and in reverse orientation upon said table.

4,118,025
DOCUMENT CONVEYING MEANS

Clement R. Konars, Glen Cove; Frank J. Schlipf, North Merrick, and Emanuel Quinci, Dix Hills, all of N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.

Continuation of Ser. No. 749,019, Dec. 9, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 860,671
Int. Cl.[2] B65H *5/02, 29/12*
U.S. Cl. 271—273 **1 Claim**



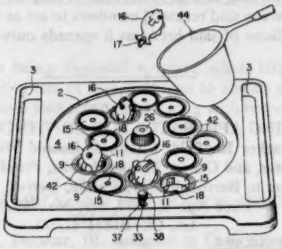
1. Means for conveying documents without roller contact on the documents, comprising,
a first pair of upper and lower driven sprockets,
a second pair of upper and lower driven sprockets,
an upper chain mounted on the upper sprockets,
a lower chain mounted on the lower sprockets,
a plurality of equally spaced friction grip members fixedly mounted on said chains so that the upper and lower grip members contact each other in the absence of a document,
means to release the documents at points along the rails, comprising,
upper rail means adjustably mounted on the frame to guide the upper chain and lower rail means adjustably mounted on the frame to directly and positively guide the lower chain and means to adjust the rails directly and positively to provide proper gripping action by the grippers,
a separate upper rail means at the releasing end of the document travel being adjustably mounted so that said separate upper rail means is adjustably inclined away from the document path so as to release the document at a desired point,
and pusher means adapted to pus the documents when released,
whereby the leading ends of the documents are gripped by the upper and lower sets of grip members and the documents are conveyed by the chains without roller contact on the documents, to a desired point along the rails where the pusher means picks up the document.

4,118,026
GAME BOARD FOR CHILDREN

Masatoshi Todokoro, 2-33 Koganehara 2-chome, Matsudo, Chiba-Prefecture, Japan (270)

Filed Feb. 28, 1977, Ser. No. 772,775
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 R **2 Claims**

1. A game board comprising:
(a) a base board (1) defining a circular recession in its center with a bottom plate;
(b) a rotary disc (4) supported in said circular recession and a prime mover, said rotary disc being coupled thereto so as to be rotated by said prime mover;
(c) a plurality of irregularly arranged pits (9) in said rotary disc (4) set at random distances from the center of said rotary disc (4), side walls in said pits having a pair of vertical slots (11, 12) with upper and lower end parts each of which is provided with a lower engaging portion (13, 14) at the lower end part;
(d) a seat plate (15) with a spring (22) in each of said pits (9) and a popping plaything, said seat being so disposed therein as to support said plaything thereon such as a model fish, said plaything being vertically movable under the force of said pring (22);
(e) a pair of engaging lateral first protuberances (19, 20) extending outward from said seat plates (15) and disposed

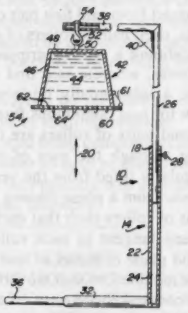


for vertical movement in said slots (11, 12) and also engaging said lower engaging portions (13, 14) when the seat plate is lowered against the force of said spring (22); and,
(f) a plurality of second protuberances (27) on said bottom plate disposed on said bottom below said pits (9), said second protuberances (27) being arranged to hit against said engaging first protuberances (19, 20) when said first protuberances are in said lower engaging portions (13, 14) and moved with the rotation of the rotary disc (4), said first protuberances, when hit, move out of said lower engaging portions causing said seat plate (15) to shoot up under the force of said spring (22).

4,118,027
LIQUID GAME AMUSEMENT SYSTEM

William H. Cody, 1200 T-1 Westerly Pl., Baltimore, Md. 21228

Filed Sep. 12, 1977, Ser. No. 832,355
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 L **10 Claims**

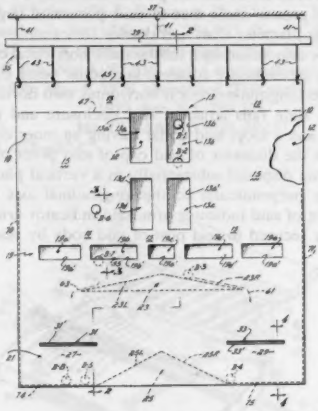


1. A liquid game amusement system, comprising:
(a) a stand member adapted to be mounted on a base surface;
(b) container means releasably securable to said stand member, said container means forming a cavity adapted to contain a liquid inserted therein, and generally defining a substantially horizontal rim;
(c) cover means mounted to a rim portion of said container means in a manner such that said liquid is maintained within said container means by atmospheric pressure acting on a lower surface of said cover means, said cover means being positionally located in interfacing relation with said container means rim, and;
(d) weight means for applying a force to said cover means in an opposing direction to a force applied by said atmospheric pressure, said weight means being releasably securable to said cover means external said container means.

4,118,028
PITCHING TARGET WITH BALL COLLECTOR

Edward P. Larkin, 400 Stanton Ave., Cincinnati, Ohio 45174

Continuation-in-part of Ser. No. 785,767, Apr. 7, 1977, abandoned. This application May 9, 1977, Ser. No. 794,747
Int. Cl.[2] A63B *63/04*
U.S. Cl. 273—26 A 10 Claims



1. A pitching target for collecting and storing pitched balls incident on strike and non-strike zones thereof, comprising:

a front sheet of lightweight highly flexible material adapted to substantially deform and deflect at localized areas of impact when incident with a pitched ball while suspended vertically from its upper edge whereby the forward motion of said incident ball is arrested and said ball falls downwardly under the force of gravity along a vertical path proximate said front sheet;

a rear sheet of lightweight highly flexible material adapted to substantially deform and deflect at localized areas of impact when incident with a pitched ball while suspended vertically from its upper edge whereby the forward motion of said incident ball is arrested and said ball falls downwardly under the force of gravity along a vertical path proximate said rear sheet;

suspension means for vertically suspending said front and rear sheets in superimposed face to face relationship, including a rigid elongated, horizontal support and a plurality of flexible elements interconnecting said support and said upper edges of said sheets at horizontally spaced points; the length of said elements and horizontal spacing being sufficient to permit substantial deflection of said front and rear sheets in the region of impact with a pitched ball;

said front sheet having a generally rectangular strike zone and at least one unapertured non-strike zone disposed horizontally, laterally on each side of said strike zone in juxtaposition therewith, said strike zone having at least one strike aperture therein, a pitched ball corresponding to a strike passing through said strike aperture to impact and locally deflect and deform said rear sheet in the region behind said strike aperture to horizontally space said sheets proximate said strike aperture and fall vertically downward between said sheets following arrest of said ball's forward motion by said rear sheet;

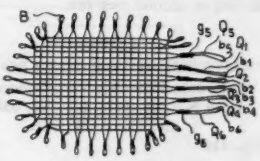
a ball collection aperture in said front sheet having vertically spaced upper and lower edges, said ball collection aperture being located below and in substantial vertical alignment with at least one of said non-strike zones, a pitched ball impacting anywhere within one of said non-strike zones of said front sheet above said ball collection aperture locally deflecting and deforming said front and rear sheets in the region of said impact to horizontally space said upper edge of said collection aperture rearwardly relative to said lower edge to open said collection aperture below said impact region such that the ball enters between the upper and lower edges of the collection aperture in order to collect said ball between said sheets as it falls downwardly after its forward motion has been arrested, by said front sheet; and

said front and rear sheets cooperating to define a ball storage zone underlying at least one of said strike and non-strike zones at a level below said ball collection aperture for storing balls collected by said strike and ball collection apertures which move downwardly between said sheets.

4,118,029
METHOD FOR MAKING A TENNIS, BADMINTON OR SIMILAR RACKET NET, NET OBTAINED BY THIS METHOD AND RACKET COMPRISING THIS NET

Jacqueline Septier, 8, rue Lentonnet, 75009 Paris, France

Filed Feb. 12, 1976, Ser. No. 657,636
Claims priority, application France, Feb. 13, 1975, 75 04514; Feb. 11, 1976, 76 03755
Int. Cl.[2] A63B *51/02, 51/14*
U.S. Cl. 273—73 D 10 Claims



5. A tennis, badminton, or similar racket comprising:

a. a handle;

b. a frame containing a plurality of holes, and having a convex shape in the areas between said holes;

c. a net containing peripheral closed loops which extend through the holes in the frame;

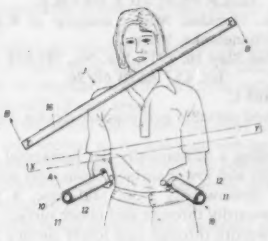
d. a cable located along the periphery of the frame, and in a threaded relation with said closed loops; and

e. a means for applying tension to said cable so that the closed loops are pulled out as the portions of the cable overlying the holes approaches the level defined by the apices of adjacent convex areas of the frame.

4,118,030
METHOD OF JUGGLING AND APPARATUS THEREFOR

Donald Gerard Randon, Gretna, La., assignor to Roberts Management, Inc., Houston, Tex.

Filed Sep. 20, 1976, Ser. No. 724,645
Int. Cl.[2] A63B *67/08*
U.S. Cl. 273—96 R 7 Claims



1. A method of juggling comprising:

grasping a first elongate member in one hand,

grasping a second elongate member in the other hand,

each of said first and second elongate members having a handle portion and a cushioning portion, said cushioning portion extending for the greater length of said elongate member and being comprised of a soft resilient covering over said elongate member and defining an outer friction gripping surface,

said first and second elongate members being held so as to extend outwardly from the holder in spaced relationship to one another and substantially horizontal,

disposing a third elongate member of substantially uniform transverse dimensions on and tranversely to said first and second elongate members, and

moving one of said first and second elongate members upwardly with a force sufficient to lift said third elongate member off of said first and second elongate members and impart rotational motion to said third elongate member, said rotational motion being around an axis generally transverse to the long axis of said third elongate member;

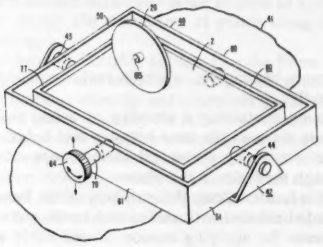
and catching said third elongate member on said first or second elongate member, said cushioning portion being such as to act as a shock absorber reducing the tendency of said third elongate member to bounce when said third member lands on said first or second member, while further reducing the tendency of said third member to slide on said first or second member.

4,118,031

AMUSEMENT TOY OR GYRO DISC

Samuel T. Westbrook, 5650 Orly Ter., College Park, Ga. 30349

Filed Nov. 21, 1975, Ser. No. 634,183
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—110 **5 Claims**



1. An amusement toy comprising a conveyor-belt, manipulative and tiltable means supporting said conveyor-belt for longitudinal movement, means for effecting longitudinal movement of said conveyor belt, and a single sole playing disc adapted to be rotated and balanced by the longitudinal movement of said conveyor-belt and manipulative tilting of said supporting means.

4,118,032

GOLF PRACTICE DEVICE

Jeffrey Koblick, Hopkins, Minn., assignor to K-tel International, Inc., Minnetonka, Minn.

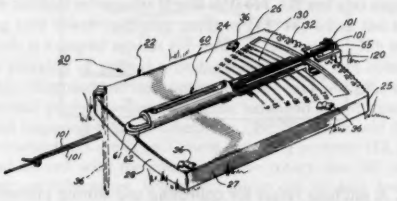
Filed May 16, 1977, Ser. No. 797,522
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—185 C **3 Claims**

1. An improved portable golf practice device comprising, in combination:

a body including a substantially flat horizontal base which has an upper and lower surface, front, rear and side walls extending downwardly from said base, a post which projects upwardly through said upper surface of said base and downwardly through said lower surface of said base to a distance less than that of said walls of said body, said post disposed so that its central longitudinal axis is substantially equidistant from said side walls of said body and adjacent said rear wall of said body and substantially perpendicular to the planes of said surfaces of said base, said base having a plurality of apertures spaced about the periphery thereof adapted to receive pegs which are to be driven into the ground for securing said body to the ground;

a pivot pin having a cylindrical shank and a cap, said shank being sized to fit within the post of said body and having a length greater than that of said post, said cap being greater in diameter than said shank;

an indicator arm including a substantially horizontal collar at one end, an enclosure adjacent said collar being disposed so that its longitudinal axis is horizontal, two horizontally opposed slide rails adjacent said enclosure and parallel thereto, and a loop, said collar having an inner diameter less than the diameter of said cap of said pivot pin, said loop being disposed substantially in a vertical plane substantially perpendicular to the longitudinal axis of said enclosure of said indicator arm, said indicator arm being pivotally secured to said post of said body by said pivot pin;



a slidable yoke having a central section, opposed side sections and flanges on each of said side sections, said flanges slidably securing said yoke between said slide rails of said indicator arm;

a helical spring having one end secured about said shank of said pivot pin between said cap of said pivot pin and said collar of said indicator arm and having another end secured to said yoke, said helical spring being adapted to fit within said enclosure of said indicator arm;

a distance indicator having a central portion, opposed side portions and vertically spaced flanges on each of said opposed side sections, said flanges securing said distance indicator between said slide rails of said indicator arm;

cord attached at one end to said yoke passing through said loop at the end of said indicator arm, said cord being a length great in comparison with the length of said indicator arm; and

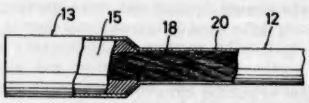
a golf ball secured to said cord at its other end.

4,118,033

DEVICE FOR PRACTICING GOLF SWING

Toshiyuki Miyamoto, 33-101 Tamagawa 2-chome, Takatsuki City, Osaka, Japan

Filed Feb. 14, 1977, Ser. No. 768,372
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 A **7 Claims**



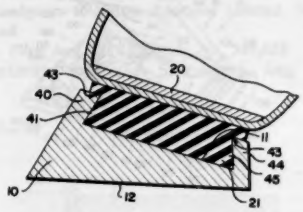
1. A golf-swing-practicing device embodying in combination an assembly of components comprising a shaft having a weight attached to one end of the shaft; said shaft being composed of a composite core member and a plurality of strands twisted around said core member; each of the strands being formed of a plurality of steel wires twisted together; and said

composite core including a flexible core element and an adjacent non-flexible core element arranged substantially in end-to-end axial alignment with each other.

4,118,034
GOLFER'S STANCE BLOCK

John P. O'Brien, 175 E. Delaware Pl., Chicago, Ill. 60611

Continuation-in-part of Ser. No. 753,927, Dec. 23, 1976, Pat. No. 4,073,075, and a continuation-in-part of Ser. No. 735,761, Oct. 26, 1976, Pat. No. 4,081,918, and a continuation-in-part of Ser. No. 683,898, May 6, 1976, abandoned. This application Mar. 23, 1977, Ser. No. 780,271
Int. Cl.[2] A63B *57/00, 69/30*
U.S. Cl. 273—32 C **5 Claims**



1. A wedge-shaped golf training device adapted to be removably affixed to a shoe, said training device comprising a wedge-shaped body having a lower, ground engaging surface, and an upper support surface, said upper support surface adapted to support the lower surface of a shoe, said wedge-shaped body including an upper extension and a lower extension, said extensions extending upwardly from said upper support surface, said extensions having inward surfaces inwardly inclined whereby an acute angle is formed by said inward surfaces and said upper support surface, said inward surfaces being adapted to engage the opposite outer edges of the sole of the shoe.

4,118,035
MATRIX GAME APPARATUS

Deborah Row, Box 301, Point Pleasant, Pa. 18950

Filed Nov. 29, 1976, Ser. No. 745,734
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—243 **14 Claims**

1. An apparatus for playing an educational and entertaining game, comprising:

means for displaying a plurality of predetermined designs to be used in playing the game;

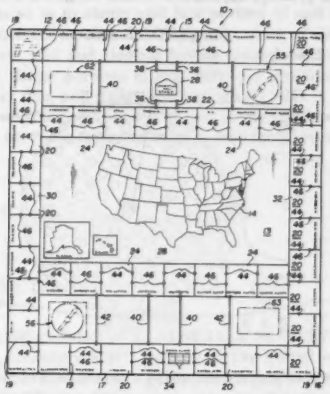
game means for producing by chance determining means combinations of elements of a first type and elements of a second type, said game means including a deck of cards having combinations of one of a plurality of elements of a first type and one of a plurality of elements of a second type; and

score means for each player to form one of said plurality of predetermined designs in playing the game, said score means being comprised of a grid with areas located in the grid identified by said elements in the first type along one side and said elements of a second type along perpendicular side whereby particular areas may be allocated in response to the player obtaining particular combinations of elements of the first and second types by use of the game means whereby one of the particular designs may be formed on the score means.

4,118,036
PRESIDENT ELECTION GAME

Salvador Marse, 320 S. Harrison St., East Orange, N.J. 07018

Filed Apr. 20, 1977, Ser. No. 789,098
Int. Cl.[2] A63F *3/04*
U.S. Cl. 273—257 **30 Claims**



1. A presidential election game for one of the players to win and thus become "President", said game comprises in combination:

A. a game board having a playing surface,

B. a series of outer zones extending along each side of the periphery of said game board,

C. a first series of inner zone extending across said playing board and contiguous to said outer zones along spaced apart sides of said game board,

D. a second series of inner zones extending across said playing board in spaced apart relation to said first series of inner zones and contiguous to said outer zones along spaced apart sides of said game board,

E. said outer and inner zones comprising at least 51 voting areas comprised of the 50 States and the District of Columbia,

F. first numerical indicium contained on each of said zones, said first numerical indicium being designative of the number of popular and/or electoral college votes allocated to each of said areas,

G. second numerical indicium contained on each of said zones, said second numerical indicium being designative of the possible minimum number of popular votes needed to respectively win each of said areas, based upon a certain number of players of the game,

H. said zones being divided into different groups by color designation according to their population and/or electoral college votes representation,

I. pathways between adjoining zones on said game board,

J. a set of chance cards, each said chance card having indicia thereon representative of an advantage one player may

exercise over another player or a hazard that a player must suffer,

K. chance means operable by players of the game apparatus so as to produce a random number for determining the number of zones the player may advance,

L. posting means for indicating the number of popular and/or Electoral College votes posted by a player as the game progresses, and

M. a marker for each player that differs in color or configuration, said marker placed initially on one said zone by each said player and progressively moving from zone to zone by utilization of said chance means through said pathways and accumulating votes in order to win the election and become "President".

4,118,037

RECORD PLAYER

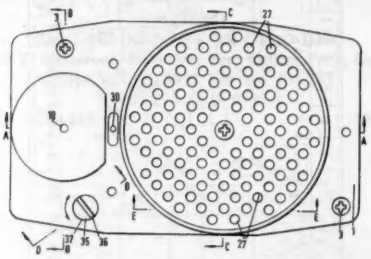
Mun-Hay Ngai, 3/Fl. Flat C, 130-132 Argyle St., Kowloon, Hong Kong

Filed Apr. 29, 1977, Ser. No. 792,417

Claims priority, application United Kingdom, Jan. 7, 1977, 591/77

Int. Cl.[2] G11B *3/00*

U.S. Cl. 274—1 A **11 Claims**



1. A record player comprising a container, a turntable rotatably mounted therein, a record on said turntable, said record containing a relatively deep circular groove at the end of the sound track, an electric motor for driving the turntable, a motor circuit and switch for enabling and disabling the motor, a speaker mounted in said container for movement toward the turntable, spring means for biasing the speaker toward the turntable, a tone arm having a stylus, movable with the speaker toward the turntable so as to hold the stylus engaged with the record on the turntable, said spring means being operable when the stylus reaches said circular groove to displace the tone arm downwardly to seat the stylus in the groove and means movable downwardly with the speaker and tone arm to disable the switch.

4,118,038

VIBRATION TRANSMISSION MECHANISM FOR A PHONOGRAPH

Katsumi Watanabe, Kawasaki, Japan, assignor to Yugen Kaisha Watanabe Kenkusho, Kawasaki, Japan

Filed Apr. 14, 1977, Ser. No. 787,445

Claims priority, application Japan, Aug. 21, 1976, 51-10003

Int. Cl.[2] G11B *3/28, 3/40*

U.S. Cl. 274—9 B **5 Claims**

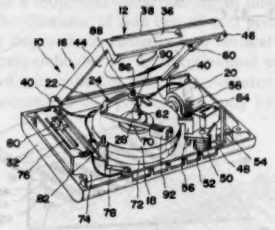
1. In a sound reproducing apparatus of the type wherein the mechanical vibrations set up in a reproducing stylus by the groove undulations of record means are transmitted directly to rotatable speaker means to cause the speaker means to generate audible sound, the improvement comprising:

(a) means rotatable with the speaker means relative to the record means,

(b) a tone arm pivotally supported at one end on said rotatable means,

(c) a stylus carried on the tone arm proximate its other end, and

(d) a vibration transmitter rod supported at least at one end on said rotatable means and held in contact with the speaker means at a point intermediate both ends thereof, the other end of said tone arm being held in contact with said vibration transmitter rod for sliding movement, during playback, between the outer end of said vibration transmitter rod and its point of contact with the speaker means such that the vibrations of the stylus are transmitted to the speaker means via said tone arm and said vibration transmitter rod, and



wherein said tone arm and said vibration transmitter rod are so constructed and arranged that, during playback, the distance between the stylus and the variable point of contact of said tone arm with said vibration transmitter rod changes substantially in proportion to the distance between said variable point and the fixed point of contact of said vibration transmitter rod with the speaker means such that the variations in amplitude of sound reproduction are minimized over the length of travel of the tone arm.

4,118,039

TONEARM POSITION SETTING APPARATUS

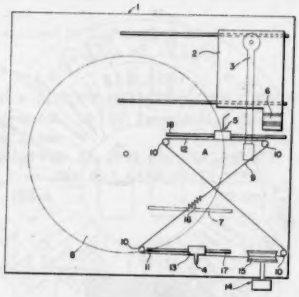
Junichi Kurata; Kazushige Ishikawa, and Nozomu Nagashima, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 7, 1977, Ser. No. 840,448

Claims priority, application Japan, Oct. 7, 1976, 51-120647

Int. Cl.[2] G11B *3/06*

U.S. Cl. 274—9 RA **5 Claims**



1. A tonearm position setting apparatus for automatically setting a tonearm in a predetermined position of a record disc comprising:

(a) a linearly movable tonearm base on which said tonearm is mounted at one end, a pick-up stylus being mounted on the other end of said tonearm,

(b) a light source movable substantially parallel to the movement direction of said tonearm base,

(c) a position setting means interlocked with said light

source and adapted to be movable maintaining a constant positioning relationship with said light source,

(d) a position detecting means provided in said tonearm base for detecting the position of said position setting means, and

(e) a semi-transparent mirror provided in about an intermediate position between loci of said light source and said pick-up stylus, whereby said tonearm is moved to a position of the virtual image of said light source formed symmetrically with reference to said semi-transparent mirror by detecting the position of said position setting means.

4,118,040

CONTACTLESS SEAL

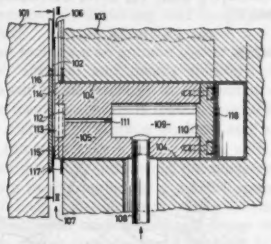
Alfred Christ; Helmut Lehmann, both of Zurich; Ludwig Kantor, Mutschellen, and Helmut Miller, Niederrohrdorf, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 26, 1976, Ser. No. 718,085

Claims priority, application Switzerland, Aug. 29, 1975, 11219/75

Int. Cl.² F16J *15/34*

U.S. Cl. 277—75 **19 Claims**



1. In combination with a stationary part and a rotatble part disposed to rotate about an axis of rotation and defining a space with said stationary part, a contactless seal for sealing the space between said parts; said seal including

a sealing member disposed about said axis of rotation and having at least two sealing surfaces concentric to said axis of rotation and spaced from said rotatable part to define gaps therebetween for the escape of barrier medium, said sealing member including a plurality of segments movably mounted in said stationary part for movement under a biasing force towards said rotatable part, each said segment having at least one pressure chamber between said sealing surfaces, said chamber being open towards said rotatable part and being connectable to a supply of barrier medium to receive a flow of barrier medium therefrom, said chambers of said segments being distributed peripherally of said sealing member;

a plurality of restrictors, each restrictor being disposed between a respective one of said chambers and the supply of barrier medium to throttle the flow of barrier medium to said respective chamber; and

means biasing each said segment toward said rotatable part.

4,118,041

SEAL STRUCTURE

Kazumasa Futamura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 22, 1977, Ser. No. 809,020

Claims priority, application Japan, Mar. 1, 1977, 52/21777

Int. Cl.² F16J *15/02*

U.S. Cl. 277—180 **3 Claims**

1. A seal structure comprising first and second structural members having co-operating seal face portions, a seal element interposed between said co-operating seal face portions, stud bolts each having a central flange portion and first and second screw portions provided at opposite sides of said flange portion, said seal face portion of said first structural member having threaded openings in which are firmly screwed said first screw portions of said bolts, so that said bolts are firmly maintained in the screwed-in position by tight frictional engagement between said seal face portion of said first structural member and said flange portions of said bolts, said seal face portion of said second structural member having through

openings through which are passed said second screw portions of said bolts, and nuts mounted to said second screw portions of said bolts so as to clamp said face portion of said second structural member between said flanged portions of said bolts and said nuts, said seal element having through openings in which said flange portions of said bolts are positioned and being thicker than said flange portions of said bolts in its free condition and being compressed by said co-operating seal face portions to be of the same thickness as said flange portions.

4,118,042

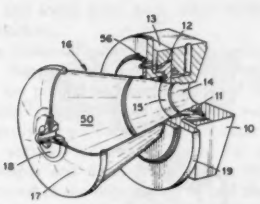
AIR BEARING VACUUM SEAL ASSEMBLY

Rex Booth, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 27, 1977, Ser. No. 837,252

Int. Cl.² F16J *15/40*; G21G *4/02*

U.S. Cl. 277—226 **11 Claims**



1. A rotating vacuum seal assembly comprising a stator, a rotor, and means for rotatably mounting said rotor adjacent said stator, said mounting means being constructed so as to provide a gap between said rotor and said stator and a gap between said rotor and said mounting means, each of said stator and said rotor having a centrally located opening therein adapted to be connected to vacuum, means for directing air under pressure through said gap between said rotor and said stator and between said rotor and said mounting means forming an air cushion therebetween, and means for producing differential pumping for maintaining a pressure gradient between said air cushion and said centrally located openings of said stator and said rotor for producing a leak rate of less than 1×10^{-4} Pa m^3/s.

4,118,043

SLED ROLLER DEVICE

Charles W. Brubaker, Beaver, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jun. 15, 1977, Ser. No. 806,951

Int. Cl.[2] B62B *13/18*

U.S. Cl. 280—8 **1 Claim**

1. A sled roller device for affixing a roller to a runner of a sled to permit use of the sled on a surface having a high coefficient of friction, said sled roller device comprising

a bracket having a pair of symmetrical halves each having an upper part and a lower part with an indentation formed in the upper part for accommodating half the cross-sectional area of the runner of a sled, each of the halves having a transverse bore formed therethrough in the upper part thereof in alignment with the other spaced beneath the indentation thereof and one of the halves having a second transverse bore formed therethrough and opening into the indentation thereof, the lower parts of the halves being spaced from each other and having indentations formed therein in alignment facing each other;

a set screw threadedly coupled in the second bore of the one of the halves for tightening the bracket in position;

a roller rotatably mounted in the indentations of the lower parts of the halves; and

a bolt accommodated in the aligned bores formed through the halves for affixing the halves to each other on opposite sides of the runner with the runner accommodated in the indentations of the upper parts of the halves.

4,118,044

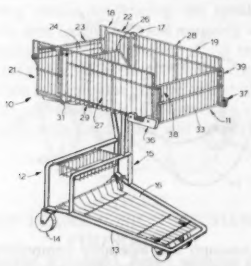
GATE MECHANISM FOR CART

Harry Celms, Battle Creek, Mich., assignor to Roblin Industries, Inc., Battle Creek, Mich.

Filed Apr. 15, 1977, Ser. No. 787,886

Int. Cl.[2] B62B *11/00*

U.S. Cl. 280—33.99 F **19 Claims**



1. In a shopping cart having an upwardly opening basket including spaced sidewalls upstanding from a bottom wall, the basket having an opening in one end thereof, and a gate movably supported on the basket for closing the opening, the improvement comprising:

mounting means coacting between the gate and the basket for permitting movement of said gate between a first position wherein the gate projects upwardly from the bottom wall and closes said opening and a second position wherein the gate is disposed in an opened position located below and approximately parallel with said bottom wall;

said mounting means including first means for permitting said gate to be swingably moved from said first position into an intermediate position wherein the gate extends at least partially outwardly away from the basket in a direction which is approximately parallel with the bottom wall, and second means for permitting the gate to be substantially slidably displaced as a unit from said intermediate position into said second position wherein at least a majority of the gate is disposed beneath the bottom wall.

4,118,045

BICYCLE

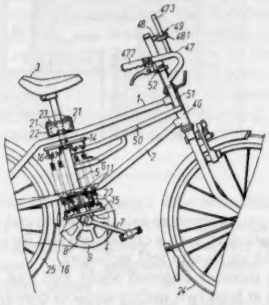
Kuniyoshi Kanazawa, 2-21-5 Nakamiya, Asahi-ku, Osaka-shi 535, Japan

Filed Dec. 27, 1976, Ser. No. 754,100

Claims priority, application Japan, Jan. 12, 1976, 51-1943[U]; Apr. 27, 1976, 51-53740[U]; Apr. 27, 1976, 51-53741[U]; Jun. 11, 1976, 51-76495[U]; Jun. 11, 1976, 51-76496[U]; Aug. 30, 1976, 51-115961[U]

Int. Cl.[2] B62K *19/04*

U.S. Cl. 280—283 **3 Claims**



1. In a bicycle having an upper and lower frame; a saddle support having a saddle mounted on the upper end of said saddle support; means for elastically suspending said saddle support from said upper frame; drive crank means mounted to the lower end of said saddle support independently of said upper and lower frames; a front wheel control shaft; and a handle having handle means preventing transmission of vertical motion from said front wheel control shaft to said handle, said handle being connected to the saddle support independently of said front wheel control shaft, the improvement comprising:

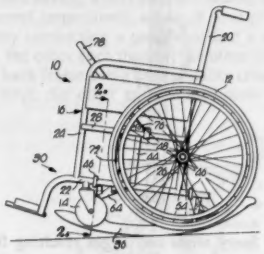
a longitudinal rod connected at one end to said saddle support and terminating at its other end into two forked portions each connected to a sleeve rotatably fitted over a lever, said levers being joined at their top portion by a connecting member having a slot in its center portion and rotatably and slidably fitted over said front wheel control shaft, said handle including a pair of curved upwardly extending handle levers each connected at its inner end to the upper portion of each of said sleeves, each of said handle levers having an upwardly extending connecting pin mounted on its upper surface; and

a bilaterally extending sub-handle mounted at its center portion to the top of said front wheel control shaft and having a slot at each of its ends to slidably receive each of said upwardly extending connecting pins.

4,118,046
ROCKER ASSEMBLY FOR WHEELCHAIRS

Curtis T. Vaughan, 1925 Jackson, Joplin, Mo. 64801

Filed Jul. 14, 1977, Ser. No. 815,678
Int. Cl.[2] A47C 3/029
U.S. Cl. 280—289 WC 10 Claims



1. Rocker structure for mounting on a wheelchair and comprising:

a frame assembly;

means for removably mounting said frame assembly to said wheelchair;

a rocker unit including an arcuate rocker adapted to engage a support surface, and means shiftably coupling said rocker to said frame assembly for movement of the rocker, when the frame assembly is mounted on the wheelchair, between a retracted storage position and a use position wherein the rocker is in engagement with said support surface for rockably supporting the wheelchair,

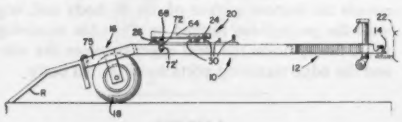
said coupling means including a pair of spaced, generally parallel linkage arms, means pivotally connecting each of the arms between said rocker and frame assembly, and stabilizing means comprising a first rigid bracing leg secured to one of said arms for engaging the rocker when the latter is in said use position, a second leg for the other of said arms which includes a pair of pivotally interconnected sections, means pivotally securing one end of the second leg to the other of said arms, means pivotally securing the remaining end of said second leg to said frame assembly, and means for rigidifying said second leg when the rocker is in said use position; and an

operating mechanism operatively connected to said rocker unit for selectively moving said rocker between said retracted and use positions.

4,118,047
VEHICLE TOWING TRAILER

Leo B. Neasham, Rte. 2, Box 605L, Highlands, N.C. 28741

Filed Sep. 28, 1977, Ser. No. 837,474
Int. Cl.[2] B62D 53/04
U.S. Cl. 280—402 5 Claims

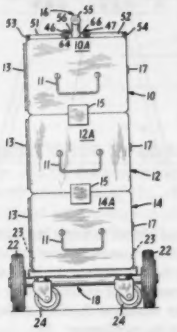


1. A motor vehicle towing trailer comprising a main carriage frame having a leading end provided with hitching means, a trailing end provided with ground engaging wheels on opposite sides thereof, and a support platform on which the front or rear wheels of a motor vehicle to be towed may be supported, said support platform comprising a leading support rod and a trailing support rod extending generally transversely of said carriage frame, and a swivel support plate extending beneath said support rods, said support rods being secured to said support plate in the assembled condition thereof with said support plate including means for selectively securing one of said support rods in a series of different positions from front to rear with respect to said support platform, each of said support rods being angle plates of inverted V-shape in cross section and including downwardly extending front and rear sides whereby the wheels of a vehicle to be towed may be disposed between the front side of said trailing support rod and the rear side of said leading support rod, and said means for securing said one of said support rods in a series of different positions comprising a plurality of rows of threaded studs extending upwardly from said support plate in locations from front to rear of said support platform, and wherein said one of said support rods may be selectively positioned between any desired position between successive studs in each of said rows of threaded studs.

4,118,048
WHEELED SAMPLE CASE

Douglas M. Spranger, Brooklyn; Malcolm J. Brookes, New York, both of N.Y., and Paul J. Mulhauser, Paramus, N.J., assignors to Seiko Time Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,935
Int. Cl. B62B 3/00
U.S. Cl. 280—47.35 9 Claims



1. A sample display unit comprising

a plurality of stackable display cases, each having front and rear compartments hingedly mounted for movement towards and away from each other between open and closed positions,

cooperating means on each of said display cases for retaining adjacent display cases releasably in vertically stacked relation for pivotal movement of their front and rear compartments as units about a common vertical axis, and

a wheeled dolly having substantially coplanar front and rear platform sections hingedly mounted for angular movement towards and away from one another, said dolly being secured to the bottom one of said display cases for integral movement of the display case front and rear compartments with the dolly front and rear sections, respectively, about said common vertical axis.

4,118,049
DEVICE FOR THE FIXING OF A BEAM TO THE CHASSIS OF A TOURING CARAVAN

Roger Tunesi, 12 Monte Beaumur, Vienne-Isere, France

Filed Sep. 16, 1976, Ser. No. 723,677
Claims priority, application France, Sep. 16, 1975, 75 28898
Int. Cl.[2] B60D 1/14
U.S. Cl. 280—483 12 Claims

7. A tow bar arrangement for a caravan, said tow bar arrangement adapted to be connected to a caravan chassis, the tow bar arrangement comprising:

a pair of U-shaped tow bar beams;

a hitch coupling secured to a forward end of each of said

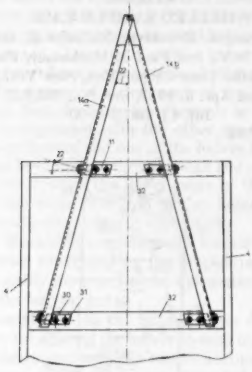
pair of tow bar beams, said hitch coupling being adapted to connect said forward end of each of said pair of tow bar beams to a towing vehicle;

first connecting means securing one of said pair of tow bar beams to said caravan chassis so as to extend forwardly from said caravan chassis;

second connecting means securing the other of said pair of tow bar beams to said caravan chassis so as to extend forwardly from said caravan chassis, said first and second connecting means securing said one and said other of said pair of tow bar beams respectively so as to converge into each other at a point forward of said caravan chassis at which said hitch is located;

said first and second connecting means each comprising:

a connecting component having one end mounted to said tow bar beam and another end mounted to said chassis;



fastener means directly securing said connecting component to said caravan chassis;

an insulating deformable material interposed said connecting component and said tow bar beam, said insulating deformable material further being nested within said U-shaped tow bar beam;

first means fixing said one of said U-shaped tow bar beams to said first connecting component with said insulating deformable material interposed, whereby said one of said tow bar beams is insulated from said caravan chassis; and

second means fixing said other of said U-shaped tow bar beams to said second connecting component with said insulating deformable material interposed, whereby said other of said tow bar beam is insulated from said caravan chassis.

4,118,050

SKI HAVING A THREE-DIMENSIONAL RUNNING SURFACE

Hermann Schnurrenberger, Straubing, Germany, assignor to Franz Volkl öHG, Strubing, Germany

Filed Mar. 11, 1977, Ser. No. 776,682

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610522; May 4, 1976, 2621490

Int. Cl.² A63C *5/04*

U.S. Cl. 280—604 **22 Claims**

1. An improvement in a ski having a tip and a rear end, a middle region, a running surface and a profiling transverse to the longitudinal axis of the ski in at least one region of the underside of the ski intermediate said tip and said rear end, a rifling of grooves extending transversely to the longitudinal axis of said ski in said region of the underside of the ski and constituting at least part of said transverse profiling, portions of said ski underside adjacent said region and up to said tip, on the one hand, and up to said rear end, on the other hand, are smooth, said transverse grooves are cut into the material constituting the underside of said ski, said running surface constituted of synthetic plastics material, said rifling of grooves located in said middle region and said transverse grooves

having partially fuzzy walls and edges resulting from rough chip removing treatment.

4,118,051

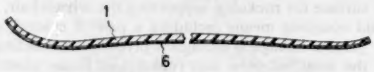
INJECTION MOLDED SKI AND METHOD FOR PRODUCING THE SAME

Yoshiharu Shima, Ueda, Japan, assignor to Nissei Plastics Industrial Co., Ltd., Japan

Filed Dec. 17, 1976, Ser. No. 751,755

Int. Cl.² A63C *15/00*

U.S. Cl. 280—610 **14 Claims**



1. A ski comprising, in combination:

a molded ski body having a pair of edge receiving portions extending longitudinally along the sides of the ski body on the bottom surface thereof;

each of said edge receiving portions being provided with a plurality of projections arrayed along the length thereof at regular intervals;

a pair of edge members each having a plurality of fixing pieces on one side thereof and adapted to be attached to the ski body by mating with the projections on the edge receiving portions of the ski body;

the height of each of said projections being slightly larger than the thickness of the fixing pieces of the edge members to be secured thereon;

the bottom surface of the ski body being irregular in shape; and

a sole plate integrally formed to mate with the irregular bottom surface of the ski body, whereby said sole plate covers the bottom surface of the ski body and, together with the projections formed on the edge receiving portions, firmly holds the steel edges between the sole plate and the edge receiving portions of the ski body.

4,118,052

COLLAPSIBLE STROLLER

Ramon Jané Cabagnero, 203 Cartagena St., Barcelona, Spain

Filed May 13, 1977, Ser. No. 796,704

Claims priority, application Spain, May 26, 1976, 221.222[U]; Jul. 6, 1976, 222.387[U]; Oct. 22, 1977, 224.112[U]

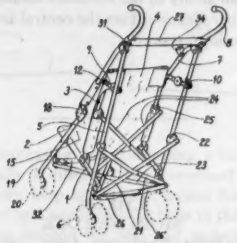
Int. Cl.² B62B *11/00*

U.S. Cl. 280—642 **6 Claims**

1. A collapsible stroller comprising a bottom cross frame including interpivoted rigid arms, a back cross frame including interpivoted rigid arms, a pair of pivot means each for interconnecting an arm of said bottom cross frame to an arm of said

back cross frame at one end of each of said respective arms so that said bottom and back cross frames are pivotable relative to each other and said arms of each cross frame are pivotable relative to each other,

a pair of front wheel foldable support struts, a pair of rear wheel rigid support struts, said front and said rear wheel struts each having wheel means rotatably supported on an end thereof respectively, a pair of strut pivot means each pivotably connecting a said front and a said rear wheel strut at the other ends thereof, the other ends of said arms of said back frame being each slidably connected to a rear wheel strut, the other ends of said arms of said bottom



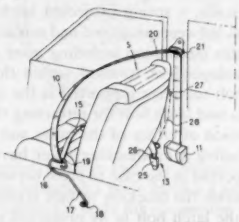
cross frame being each pivotably linked to a said foldable front wheel strut at a point thereof adjacent said wheel means, a pair of seat support arms each having one end pivotably linked to a said front wheel strut and the other end thereof pivotably linked to a said rear wheel strut, a pair of back rest support arms each having one end pivotably linked to a said support arm at a point between said front and rear wheel struts, a pair of linking means each for linking the other end of a said back rest support arm to a said rear wheel support strut, said linking means being adjustable to vary the angular position of said back rest support arms relative to said seat support arms.

4,118,053

SAFETY BELT DEVICE WITH A WINDER/UNWINDER ESPECIALLY FOR AUTOMOBILES

René Elie Neveux, Les Clayes-sous-Bois, France, assignor to Societe Anonyme Francaise du Ferodo, France

Filed May 3, 1977, Ser. No. 793,269
Claims priority, application France, May 5, 1976, 76 13259
Int. Cl.[2] B60R *21/02*
U.S. Cl. 280—747 **8 Claims**



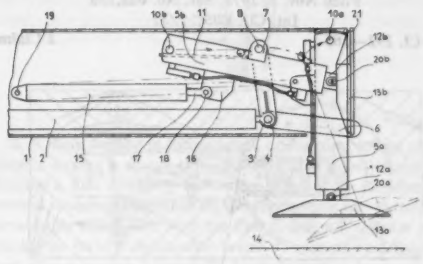
1. A safety belt device with a winder/unwinder for vehicles, especially of the automobile type, comprising a continuous belt strap one end of which is fixed to an anchorage point on the vehicle structure and the other end of which is connected to a strap winder/unwinder, the structure of the vehicle being equipped in addition with an attachment means with which the said strap is adapted to cooperate by sliding to provide, under the condition of use of the device, a sub-abdominal portion and a cross-belt portion which come from the said winder/unwinder, the said anchorage point comprising a buckle component which is customary for safety belts, which is adapted to be activated directly or indirectly so as to provide separation of the strap end which is fixed to the anchorage point from the structure of the vehicle, this occurring without touching the strap.

4,118,054

HYDRAULIC DEVICE FOR A STABILIZING BEAM IN A MACHINE USED ON UNEVEN TERRAIN

Robert Vigerie, Saint-Chamond, France, assignor to Creusot-Loire, Paris, France

Filed May 10, 1977, Ser. No. 795,541
Claims priority, application France, May 12, 1976, 76 14318
Int. Cl.[2] B60S *9/00*
U.S. Cl. 280—765 **7 Claims**



1. A hydraulic actuating device for use with a stabilising beam for a machine for use on uneven terrain, the stabilising beam providing a lateral extension of the chassis of the machine and having a support jack mounted on the end of the stabilising beam remote from the machine chassis such that the support jack is movable between an operating position in which the jack is vertical and bears on the ground through the intermediary of a sole plate attached to the end of the piston rod of the support jack and a position in which the jack is substantially horizontal and located within the stabilising beam, said device including a double-acting actuator jack arranged with its cylinder pivoted to the stabilising beam and its piston rod pivoted to the cylinder of the support jack, said actuator jack being connected to a hydraulic circuit which is also connected to said support jack and includes a first, a second and a third non-return valve and a first and a second conduit for supply and take-off of pressurised fluid, said first conduit being connected directly by branch conduits to a first one of the chambers of said support jack and the actuator jack on that side of the respective piston which is subjected to the action of the pressurised hydraulic fluid to retract the piston rods of said jacks, and said second conduit being connected directly by branch conduits to the second one of the chambers of said jacks, wherein said non-return valves are pressure-sensitive, and:

said first valve is connected in the conduit connected to said second chamber of said actuator jack and is normally open in the sense which admits fluid to that chamber, said first valve being opened in the opposite sense in response to a predetermined pressure in a conduit connected to said first chamber of said actuator jack,

said second valve is connected in the conduit connected to said second chamber of said support jack and is normally open in the sense which admits fluid to that chamber, said second valve being opened in the opposite sense in response to a predetermined pressure in a conduit connected to the conduit connected to said first chamber of said actuator jack,

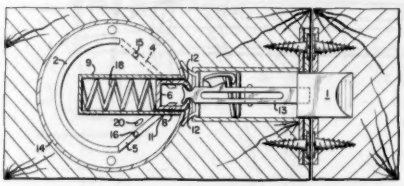
said third valve is connected in the conduit connected to said second chamber of said support jack between said second valve and said second fluid supply and take-off conduit

and is normally open in the sense which permits fluid to be exhausted via said second conduit, said third valve being opened in the opposite sense in response to a predetermined pressure in a conduit connected to a chamber inside said piston rod of said actuator jack which chamber opens into said first chamber of said actuator jack when said piston rod is retracted and opens into a conduit connected to said second chamber of said actuator jack when said piston rod is advanced, and said predetermined pressure at which said first valve is operated is higher than said predetermined pressure at which said second valve is operated.

4,118,055
TURNING MECHANISM

Robert F. Bischoff, Jr., 30 Fairmount Ave., Morristown, N.J. 07960

Filed Nov. 3, 1975, Ser. No. 628,138
Int. Cl.[2] E05C *1/12*
U.S. Cl. 292—165 **2 Claims**

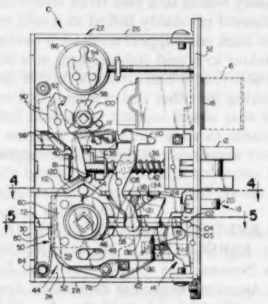


1. An improvement in a turning mechanism of a lock, comprising in combination, a turning mechanism housing means, a spindle means, a lever means, a locking rod means, a retractor housing means, a retractor means, a spring means, and a latch bolt mechanism member means; with the turning mechanism housing means having handle means which turn in any direction and having a locking assembly means therein and therebetween said turning mechanism housing means containing therein a spindle means, which spindle means moves with the handle means, said spindle means to utilize in part an area proximate to the turning mechanism housing means and contained therein, said spindle means shaped to be arched in an inner large portion, said arched portion adjoined at its side edges with plates relatively perpendicular to it, which said plates are adjoined to other smaller arched portions relatively perpendicular to the said side edge plates, which said other arched portions engage with the handle means; a lever means moving on suitable means attached to the turning mechanism housing means, with the said movement located in the upper section of the lever means, said lever means of proper length for engagement with the retractor means, with activation of the lever means caused by rotation of the spindle means, whereby a rotation of the spindle means turns a lever means, and an opposite rotation of the spindle means turns another lever means, thereby the lever means not associated to the rotation of the spindle means turns from engagement with the retractor means; a locking rod means which is activated by the locking means within and between the handle means, said locking rod means having the general contour of the spindle means such that the rod has straight portions from the handle means and a U-shaped portion therebetween, thereby mating with the U-shaped portion of the spindle means; a retractor housing means and a retractor means, with said retractor means encased and moving back and forth in the retractor housing means, said movement occurring from lever means engagement with the retractor means within the retractor housing means, whereby when the spindle means activates the lever means, movement of the retractor means is inward, when the lever means is not activated, a spring means in the housing means behind the retractor means pushes the retractor means forward, with the said retractor housing means aligning the movement of the retractor means, with attachment of the retractor housing means to the turning mechanism housing means by fastening means, said retractor housing means having openings to correlate to the passage and the movement of the lever means with the retractor means, with the spring means positioned in the retractor housing means pushing the retractor forward; a latch bolt mechanism member means which passes through an opening in the turning mechanism housing means and into an open end of the retractor housing means to engagement with the retractor means; therefore, through the composition and the combination of these elements of the turning mechanism and the element of the latch bolt mechanism, said turning mechanism is able to allow a latch bolt great movement, because an ability of the retractor means attached to the latch bolt member means utilizes the central area of the turning mechanism housing means.

4,118,056
MORTISE LOCK

Gordon A. Alexander, Newington, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Apr. 4, 1977, Ser. No. 784,060
Int. Cl.[2] E05C *1/16*
U.S. Cl. 292—169.17 **15 Claims**



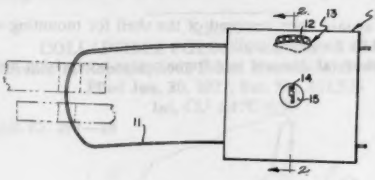
1. In a mortise lock having a case including a front and inner and outer side walls, a spring projected latch bolt movable through the front between projected and retracted positions, a latch bolt retractor mechanism including inner and outer hubs journalled for independent rotation within the housing and having a latch bolt retractor supported in the case and operably connected to said latch bolt for retracting the latch bolt in response to rotation of either of the hubs, and a deadlocking mechanism including a deadlocking lever having a blocking surface and supported in the case to pivot between a deadlocking position wherein the blocking surface is disposed in blocking relation to the latch bolt in its projected position and an inactive position wherein the blocking surface is out of the path of movement of the latch bolt and having an auxiliary bolt for controlling movement of the deadlocking lever, the improvement comprising said deadlocking lever being formed from flat metal and having a profile of substantially uniform thickness, said profile including an inclined ramp portion formed on said deadlocking lever between its pivot and said blocking surface, and means for preventing transmission of force in a latch bolt retraction direction from said latch bolt to said ramp portion, said means for preventing transmission of force comprising opposing abutment surfaces on said case and said deadlocking lever.

4,118,057

REUSABLE, TAMPER-INDICATING SEAL

Michael J. Ryan, Plainfield, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 24, 1978, Ser. No. 880,924
Int. Cl.[2] E05C 19/18; B65A 33/34
U.S. Cl. 292—307 R 13 Claims



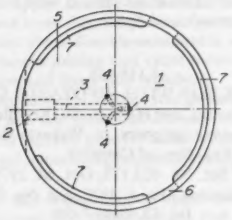
1. A tamper-indicating seal comprising a large plurality of small colored balls of different colors confined therein, means for locking a wire loop in the seal, means for segregating a small plurality of said small colored balls in the seal in a location visible from outside the seal and maintaining them in position when the wire loop is locked within the seal and means for removing the balls from the segregated location when the seal is opened and for mixing the balls whereby a different pattern of balls appears in the segregated location the next time the seal is locked.

4,118,058

TOOL FOR THE CONTACT-FREE SUPPORT OF DISCS

Oskar Rahn, and Hermann Krause, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,570
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609754
Int. Cl.[2] B66C 1/02
U.S. Cl. 294—67 B 5 Claims



1. An improved holding tool for contact-free support of discs of the type including a body having a supporting face, at least one bore within the body for connection with an extraneous gas reservoir and nozzle means in said body opening onto said support face and coupled to said bore for discharging gas streams from said reservoir through said bore and outwardly from said support face at an acute angle thereto, the improvement comprising:

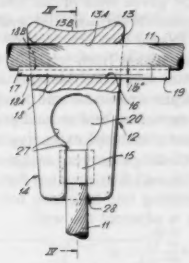
a gas escape ring mounted on the outer edge of said support face of said body, said ring having slot-shaped passages formed therethrough extending over 60 to 95% of its circumference, and said ring having at least one wall defining the more-distant boundary faces of the slotted passages with respect to the supporting face which is disposed at an acute angle with respect to said supporting face.

4,118,059

WIRE ROPE SLINGS

William Roy Mackintosh Lindsay, Lenzie, Scotland, assignor to Gyrac Engineering Products Limited, Glasgow, Scotland

Filed Aug. 29, 1977, Ser. No. 828,967
Int. Cl.[2] B66C 1/12
U.S. Cl. 294—74 7 Claims



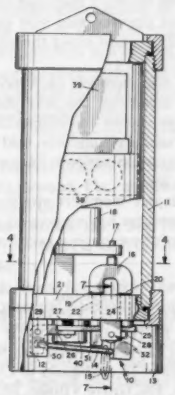
1. A sling for use in lifting loads, comprising a wire rope, a choker having a sleeve through which the rope extends and having a first coupling formation adjacent to the sleeve, a second coupling formation on the rope at one end thereof and detachably engageable with the first coupling formation of the choker to form a tightenable noose of rope around the load, said sleeve having a generally keyhole-section bore whereof the wall is composed of a part-cylindrical portion in which the rope is a sliding fit so as to be locked against lateral displacement and a channel portion which opens from the part-cylindrical portion and into which a length of the rope projects laterally, and a pin which is a sliding fit in the channel portion and is insertible into the channel portion to clamp said length of the rope against the part-cylindrical portion of the bore wall and thereby prevent slackening of the noose tightened around the load.

4,118,060

UNDERWATER RELEASE MECHANISM

Daniel Maitland Brown, San Diego, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 14, 1977, Ser. No. 787,694
Int. Cl.[2] B66C 1/00
U.S. Cl. 294—83 R 14 Claims



1. An underwater release mechanism, comprising

a watertight pressure housing;

releasable holding means attached to the outside of the

pressure housing for holding a load and operable for releasing said load;

a permanent magnet movably positioned inside the housing and having both poles adjacent a given wall of the housing for transmitting a magnetic force through the wall;

means inside the housing for moving the permanent magnet from a first position to a second position;

a keeper attached to the releasable holding means and held adjacent the given wall of the housing by said magnetic force transmitted through the wall when the permanent magnet is in said first position for preventing the releasable holding means from releasing said load, wherein the keeper is movable from the wall to enable the releasable holding means to release said load when the permanent magnet is moved to said second position; and

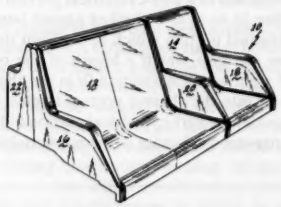
rods of magnetic material extending through the wall from the poles of the permanent magnet when the permanent magnet is in said first position for contacting the keeper and transmitting said magnetic force to the keeper when the keeper is adjacent the wall.

4,118,061

VEHICLE SEAT ASSEMBLY

Thomas Carl Atkinson, Chula Vista, Calif., and Clifford C. Fay, Uniondale, Pa., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Jul. 25, 1977, Ser. No. 818,939
Int. Cl.[2] A47C *7/02*
U.S. Cl. 296—63 **10 Claims**



1. A vehicle seat assembly having adaptability for use as both a side facing seat positioned along the side walls of various model vehicles and as front facing seat along the rear wall of various model vehicles comprising:

a plurality of seat modules, the combination being any six of the single occupant or double occupant variety, each of said seat modules having a shell-like structure with a back portion and seat portion, said seat modules having side flanges integrally formed along the edges of said seat and back portions;

a plurality of end arm members each having a panel section, first attaching means on the rear thereof and inwardly extending flange means for supportably contacting the side flanges of said seat modules, said flange means comprising a back portion support flange and a seat portion support flange; and

seat mounting adapter members attached to said vehicles, said adapter members having second attaching means on the front thereof for engaging said first attaching means.

4,118,062

CANTILEVERED SEAT-SUPPORTING SHELL WITH BUILT-IN BLOWER

Arthur J. Harder, Jr., Franklin Park, and Norman J. Kehl, Elk Grove Village, both of Ill., assignors to Coach and Car Equipment Corporation, Elk Grove Village, Ill.

Filed May 31, 1977, Ser. No. 801,841
Int. Cl.[2] B60N *1/02*; A47C *7/02*
U.S. Cl. 296—63 **9 Claims**

1. Cantilevered supporting structure for a seat located in a temperature-controlled environment, said structure comprising:

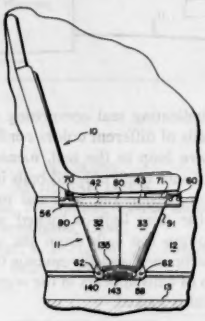
frame means comprising an upper, horizontally disposed frame portion;

a trough-shaped, structural skin located primarily below said horizontally disposed frame portion and integral with said frame means to form a shell;

said shell having a bottom inclined upwardly from its rear to its front end, a pair of sides, an open top and an open rear end;

means at said open rear end of the shell for mounting said shell on a vertical wall;

said structural skin and said frame means comprising means



cooperating to support a seat in cantilevered relation to said vertical wall;

means for locating within said shell a blower having an inlet and an outlet for circulating air;

an opening in the bottom of said structural skin;

a deflector member on the outside of said opening;

said deflector member having an axis and a plurality of vane means disposed at an angle to said axis and comprising means for deflecting air blown outwardly through said opening;

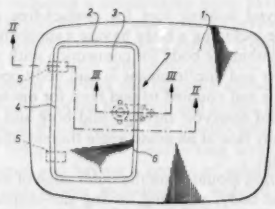
and means mounting said deflector member on said structural skin for movement among a plurality of positions, to change the direction in which said vane means deflect the air blown through said opening.

4,118,063

VEHICLE TOP WITH PIVOTABLE COVER

Horst Bienert, Gauting, and Hans Jardin, Krailling, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 622,175, Oct. 14, 1975, abandoned.
This application May 6, 1977, Ser. No. 794,344
Int. Cl. B60j *7/00*
U.S. Cl. 296—137 B **15 Claims**



1. A vehicle top with an opening having a front and a rear edge, an open frame surrounding said opening, a cover having a smooth fit in said frame and having a forward edge and a rear edge, a pivotal connection between the forward edge of said cover and said frame, near the front edge thereof, a multi-part

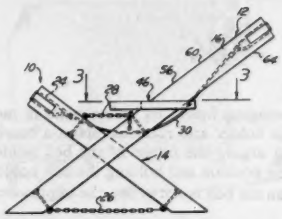
expansible opening device adjacent the rear edge of said cover, means connecting a first part of said device to said cover for pivoting about a transverse axis, said first part including an internally threaded element, a second part of said device including an externally threaded element, a third tubular part having external and internal threads engaged respectively with the threads of said first and second parts and a support means mounting said second part, a first portion of said support means mounting said second part, a first portion of said support means being mounted to said frame near the rear edge of said opening.

4,118,064

COLLAPSIBLE FOLDING ROCKING CHAIR

Terrence R. Robeson, 5662 Brace, Detroit, Mich. 48228

Filed Jun. 30, 1977, Ser. No. 811,576
Int. Cl.² A47C *4/00*
U.S. Cl. 297—18 **2 Claims**



1. A disassemblable folding seat, comprising

a three-sided rearwardly-inclined outer frame including spaced parallel outer side members and an outer cross member engaging said outer side members near the upper ends thereof,

a three-sided forwardly-inclined inner frame disposed within said outer frame and including spaced parallel inner side members and an inner cross member engaging said inner side members near the upper ends thereof,

a rectangular seat member of flexible sheet material having a forward end secured to said inner cross member and having a rearward end secured to said outer cross member,

elongated lower flexible connectors interconnecting the lower end portions of said outer and inner side members,

elongated upper flexible connectors interconnecting said outer and inner side members above and remote from said elongated lower flexible connectors, and separable interfitting means joining said cross members to their respective outer and inner side members,

said side members having wedge-shaped upper end portions and said cross members having end portions containing tapered grooves slidably and releasably receiving said upper end portions in mating engagement therewith,

each of said wedge-shaped upper end portions having a transverse slot therethrough, and each of said cross member end portions having a pair of said tapered grooves disposed in spaced parallel relationship with a tapered wall therebetween receivable within said transverse slot.

4,118,065

FOLDING PATIO CHAIR

Mervyn M. Watkins, 30241 Via Borica, Rancho Palos Verdes, Calif. 90274

Filed Aug. 29, 1977, Ser. No. 828,483
Int. Cl.² A47C *4/44*
U.S. Cl. 297—45 **16 Claims**

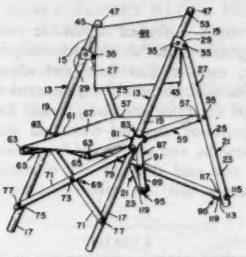
1. A folding patio chair for supporting a person in a sitting position, comprising:

a pair of parallel elongated frame tubes each having upper, lower and intermediate portions, said frame tubes defining a first plane therebetween;

a pair of parallel elongated rear support tubes each having upper, lower and intermediate portions, said upper portions of each of said support tubes being pivotally attached at a fixed position along said upper portion of a different one of said frame tubes, said support tubes defining a second plane therebetween intersecting said first plane along a line perpendicular to the longitudinal axes of said frame and support tubes;

a pair of parallel elongated seat tubes having front, rear and intermediate portions, said rear portions of each of said seat tubes being pivotally attached at a fixed position along said intermediate portion of a different one of said support tubes, said seat tubes defining a third plane there between intersecting said first plane along a movable line and intersecting said second plane along a line perpendicular to said longitudinal axis of said support tubes;

a rear x-brace having a pair of pivotally interconnected rear brace members defining a fourth plane therebetween, and rear brace members being foldable in said fourth plane, the



lower ends of each of said brace members being pivotally attached to a different one of said support tubes at said lower portions thereof;

a front x-brace having a pair of pivotally interconnected front brace members defining a fifth plane therebetween, said front brace members being foldable in said fifth plane and the lower end of each of which members being pivotally attached to a different one of said frame tubes along said lower portions thereof; and

folding means including an individual guide movably mounted along said intermediate portion of each of said frame tubes, each of said guides being pivotally attached to an associated one of said intermediate portions of said seat tubes to an upper end of one of said rear brace members, and to an upper end of one of said front brace members for simultaneously causing an upward movement of said movable line in said first plane, a lessening of the angle between said first and second planes, and a lessening of the distance between said frame tubes and between said seat tubes when said folding patio chair is moved from its open to closed configuration.

4,118,066

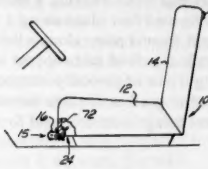
APPARATUS FOR SHADING THE SEATS OF A VEHICLE

Cyril T. Ricke, Englewood, Fla., assignor to Hex Fastener Corporation, Addison, Ill.

Filed Feb. 14, 1977, Ser. No. 768,221
Int. Cl.² A47C *7/00*
U.S. Cl. 297—184 **7 Claims**

5. A retractable shade for vehicle seat comprising a roller, a sheet of pliable material normally wound about said roller, a shaft extending longitudinally through said roller and rotatably supporting said roller, biasing means normally urging said roller in a direction winding said sheet of pliable material about said roller, a pair of end flanges fixedly supporting said shaft at each end thereof, means for adjustably attaching said end flanges to an interior portion of said vehicle and means for removably attaching the free end of said sheet of pliable material to another interior portion of said vehicle when

unwound from said roller with said sheet of pliable material being supported by the back of a seat away from the surface of the seat proper and seat back, wherein said means for adjustably attaching said end flanges to a portion of said vehicle comprises a pair of substantially U-shaped brackets each comprising a substantially L-shaped fixed member having a sidewall engaged with an exterior surface of a seat skirt and a bearing member slidably supporting a rod member extending substantially parallel to said roller and affixed at each end to one of said end flanges, whereby said rod member, end flanges and roller are laterally adjustable in position relative to said



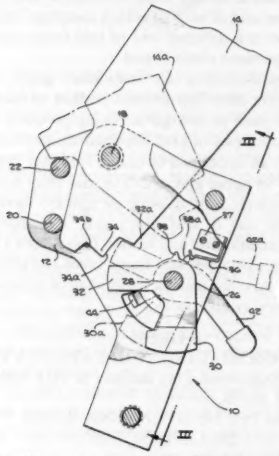
seat, a substantially L-shaped adjustable member having a sidewall engageable with the corresponding inner surface of said seat skirt, each of said fixed and adjustable members having a bottom wall portion in engagement with the bottom wall portion of the other member, means for fastening said bottom wall portions together with said skirt clamped between said sidewalls, and an integral flange section depending from at least one said sidewall and extending toward said surface of said seat skirt for resiliently concavely deforming said surface.

4,118,067

INERTIA-RESPONSIVE VEHICLE SEAT BACK LATCH MECHANISM

Akira Tanaka, Northridge, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Dec. 13, 1976, Ser. No. 750,180
Int. Cl.² B60N *1/02*
U.S. Cl. 297—379 **13 Claims**



1. An inertia-responsive seat back latch mechanism adapted for operable connection to a vehicle seat assembly having a seat back pivotally supported for forwardly tilting movement, said latch mechanism having an inertia-responsive member which, responsive to a vehicle deceleration, is moved to a seat back locking position to prevent the seat back from tilting forward, wherein the improvement comprises:

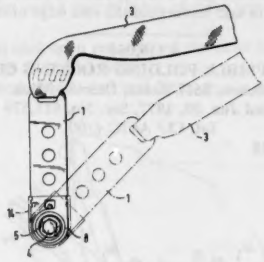
means adapted to be operably connected with the seat assembly for positively normally maintaining the inertia-responsive member in a continuously seat back locking position subsequent to the vehicle deceleration until manually unlocked.

4,118,068

SWINGING FITTING FOR SAFETY BELTS IN MOTOR VEHICLES

Artur Föhl, Schorndorf, Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Germany

Filed Sep. 16, 1977, Ser. No. 833,768
Int. Cl.² A62B *35/00*
U.S. Cl. 297—385 **7 Claims**



1. In a swinging fitting for safety belts in motor vehicles having a belt holder arm rotatable about a bearing pin and a tilting spring urging the return of the belt holder arm when tilted to a rest position and holding the belt holder arm in rest position when the belt is not in use, the improvement comprising

a. an intermediate member between the bearing pin and the tilting spring with

b. the intermediate member in locking engagement with the bearing pin and

c. with one end of the tilting spring engaged by the intermediate member and

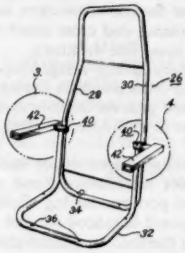
d. the other end of the tilting spring engaged by the holder arm.

4,118,069

FRAME ARM JOINT STRUCTURE FOR SEAT OR CHAIR STRUCTURE

George Taylor Hunter, Rte. 3, Box 250, Howe, Ind. 46764

Filed Oct. 7, 1976, Ser. No. 730,384
Int. Cl.² A47C *7/54*
U.S. Cl. 297—416 **10 Claims**



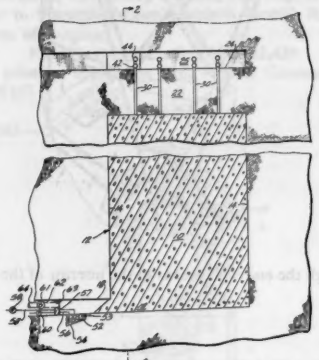
1. An arm joint structure for a seat or chair having a back, comprising an arm member, a laterally extending stem connected at one end to said member and projecting substantially at right angles therefrom, means defining an opening receiving said stem for connection to the seat or chair back, means in said stem defining a transverse slot extending approximately one fourth of the periphery of the stem and a longitudinal slot connecting said transverse slot to the other end of said stem, a pin attached to said means defining the opening and extending into said opening, said slots receiving said pin when said stem is inserted in said opening and cooperating therewith for locating said arm member in substantially horizontal and vertical positions.

4,118,070

SUBTERRANEAN IN SITU OIL SHALE RETORT AND METHOD FOR MAKING AND OPERATING SAME

Gordon B. French, and Richard D. Ridley, both of Bakersfield, Calif., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Sep. 27, 1977, Ser. No. 837,031
Int. Cl.[2] E21B *43/24, 43/26;* E21C *41/10*
U.S. Cl. 299—2 **23 Claims**



1. Means for recovering liquid and gaseous products from a subterranean formation containing oil shale comprising:

an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale;

an open base of operation in unfragmented formation at a level above a top boundary of the fragmented mass for providing access over substantially the entire horizontal cross section of the fragmented mass;

a plurality of bore holes extending through unfragmented formation between the base of operation and the top boundary of the fragmented mass, the bore holes opening into the base of operation and into an upper portion of the fragmented mass;

a separate casing sealed in each of a plurality of such bore holes, the upper end of each casing opening into the base of operation, the lower end of each casing opening into an upper portion of the fragmented mass;

valve means connected to each of such casings in the base of operation for separately controlling the flow of gas through such casings from the base of operation; and

means for introducing an oxygen-containing gas to the fragmented mass through a plurality of such casings for sustaining a combustion zone in the fragmented mass and for advancing the combustion zone through the fragmented mass.

15. A method of retorting oil shale in an in situ oil shale retort in a subterranean formation containing oil shale, such as in situ oil shale retort containing a fragmented permeable mass of particles containing oil shale, said fragmented mass having top, bottom and side boundaries, the method comprising the steps of:

excavating a first portion of formation to form an open base of operation at an elevation in the formation above the top boundary of the fragmented mass being formed;

excavating a second portion of formation for forming at least one void within the boundaries of the fragmented mass being formed;

drilling from the base of operation a plurality of bore holes in a third portion of the formation below the base of operation;

loading explosive into such blasting holes only up to an elevation lower than the bottom of the base of operation;

detonating such explosive to expand the third portion of formation toward such a void to form a fragmented permeable mass of particles containing oil shale and to leave a horizontal sill pillar of unfragmented formation between the top of the fragmented mass and the bottom of the base of operation;

sealing a separate casing in each of a plurality of such bore holes, the upper end of each casing opening into the base of operation, the lower end of such a casing opening into an upper portion of the fragmented mass;

connecting valve means to each of such casings in the base of operation for separately controlling the flow of gas through such casings from the base of operation;

establishing a combustion zone in an upper portion of the fragmented mass below the lower ends of such casings; and

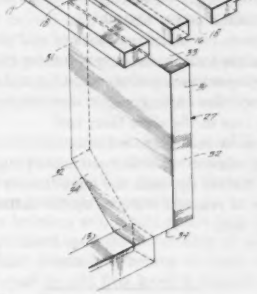
introducing an oxygen-containing gas to the fragmented mass through a plurality of such casings for sustaining the combustion zone in the fragmented mass and for advancing the combustion zone through the fragmented mass.

4,118,071

IN SITU OIL SHALE RETORT WITH A HORIZONTAL SILL PILLAR

Ned M. Hutchins, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Apr. 25, 1977, Ser. No. 790,350
Int. Cl.[2] E21B *43/24;* E21C *41/10*
U.S. Cl. 299—2 **38 Claims**



36. A method of forming, in a subterranean formation containing oil shale, an in situ oil shale retort containing a fragmented permeable mass of particles containing oil shale, said fragmented mass having top, bottom and side boundaries, comprising the steps of:

excavating a portion of the formation to form a base of operation at an upper elevation in the formation above the top boundary of the fragmented mass being formed, and leaving unfragmented formation extending from the floor of the base of operation to the roof of the base of operation as at least one roof supporting pillar within the boundaries of the base of operation, such a roof supporting pillar having adequate strength to withstand short term loads imposed by explosive expansion to form the fragmented mass in the retort; and

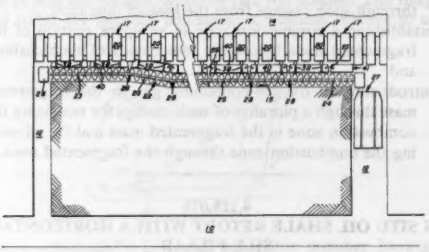
forming a fragmented permeable mass of formation particles with a top boundary at an elevation a sufficient distance below the base of operation to leave a horizontal sill pillar of unfragmented formation below the bottom of the base of operation and the top boundary of the fragmented mass for maintaining a safe base of operation, the fragmented mass having side boundaries located beneath the base of operation so as to provide effective access to essentially the entire horizontal cross section of the fragmented mass from the base of operation.

4,118,072

VARIABLE WALL MINING MACHINE

Jay Hilary Kelley, 4204 Chestnut Hill, Morgantown, W. Va. 26505, and Letcher T. White, 117 Wayne St., Manchester, Ky. 40962

Filed Jun. 6, 1977, Ser. No. 803,603
Int. Cl.[2] E21C *25/06, 25/68*
U.S. Cl. 299—43 **19 Claims**



1. A variable wall mining machine to release coal from a longwall mine face, comprising:

a plurality of side-cutting auger sections to release and convey coal along a mine face,

universal coupling means joining said auger sections together in an end-to-end relation to form an articulated auger assembly for extending along the longwall mine face,

drive means coupled to at least one auger section to rotate said articulated auger assembly,

actuator means for individual ones of said plurality of side-cutting auger sections to sump and shear cut the mine face,

sequentially operative control means for said actuator means to advance the cutting auger sections sequentially into sumping cuts in the mine face, and

scavenger plow means spaced outwardly in a partially surrounding relation with said articulated auger assembly at the side thereof opposite the mine face to facilitate transportation of released material by the cutting auger across the mine face.

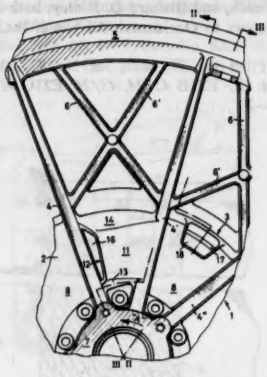
4,118,073

CAST SPOKE-WHEEL FOR MOTOR VEHICLES, ESPECIALLY MOTORCYCLES

Hans-Gunther v.d. Marwitz, Munich, Germany, assignor to Bayerische Motoren Werke AG, Germany

Filed Aug. 2, 1976, Ser. No. 710,395
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1975, 7524641
Int. Cl.[2] B60B *1/08;* B60T *5/00*
U.S. Cl. 301—6 CS **2 Claims**

1. A cast spoked wheel for motor vehicles which comprises a brake hub means connected with a wheel hub means by way of an end wall means and radially directed spoke means arranged extending over the end wall means to a rim, dividing the wheel into a plurality of sectors, characterized in that at least in one of the sectors an inclined blade means which projects with its respective forward edge pointing respectively in the direction of rotation of the spoked wheel, in the axial direction beyond the spoke means is connected by way of its respective rear edge with an adjacent spoke means and on the side of the wheel rim with a respective wall each extending from one spoke means to the adjacent spoke means and connected with the end wall means to form an air-collecting scoop case integrally with said spoke means and said end wall means and having a passage therethrough for supplying ventilating



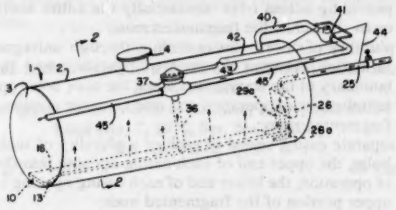
air through the end wall means to the interior of the brake hub means.

4,118,074

PULSED AIR ACTIVATED CONVEYOR AND SYSTEM

Paul E. Solt, Allentown, Pa., assignor to Fuller Company, Catasauqua, Pa.

Continuation-in-part of Ser. No. 511,410, Oct. 2, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,070
Int. Cl.[2] B65G *53/18*
U.S. Cl. 302—26 **5 Claims**



1. Apparatus for transporting solid bulk material comprising;

channel means defined by gas impervious sidewalls, endwalls and a bottom and a substantially open top;

a flexible fabric gas permeable member secured to and closing the top of said channel means for supporting solid bulk material to be transported;

wall means mounted in said channel means parallel to said sidewalls extending substantially from said bottom to said gas permeable member and dividing said channel means into a pair of contiguous plenum chambers;

means for supplying gaseous fluid at superatmospheric pressure to said channel means for passage through said gas permeable member for aerating the material supported by said gas permeable member;

means for rapidly and continuously alternating the supply of gaseous fluid first to one of said plenum chambers then to the other of said plenum chambers whereby a pulse of gaseous fluid is transmitted through said gas permeable member to the material supported on the gas permeable member and the material is vibrated and aerated to produce a mass flow of material along said gas permeable member;

said means for alternating the supply of gaseous fluid includes a diverting valve for rapidly and continuously alternating the supply of substantially all of the gaseous fluid supplied first to one of said plenum chambers and

then to the other of said plenum chambers at a frequency of at least about one cycle per second.

4,118,075

BULK MATERIAL DELIVERY APPARATUS

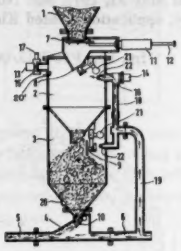
Paul Llibbehusen, Ravensburg-Durnast, Fed. Rep. of Germany, assignor to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Filed Jun. 1, 1977, Ser. No. 802,430

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625263

Int. Cl.[2] B65G *53/40*

U.S. Cl. 302—53 4 Claims



1. Apparatus for the delivery of bulk material into a pneumatic conveyor conduit, comprising a first chamber; an inlet into the first chamber for the introduction of bulk material thereinto; a first closure flap pivotal between a first position of closing the first chamber inlet and a second position of opening the first chamber inlet; a second chamber disposed below the first chamber; an outlet from the first chamber communicating with the second chamber for the transfer of bulk material from the first to the second chamber; a second closure flap pivotal between a first position of closing the first chamber outlet and a second position of opening the first chamber outlet, each said closure flap being counter-balanced whereby each closure flap when in a freely pivotal condition is at least substantially in its open position such that material flow is unimpeded by said closure flaps; an outlet from the second chamber for the discharge of bulk material therefrom into the conveyor conduit; a connecting conduit for a gas flow communication between the first and second chambers; shut-off valve means in the connecting conduit for preventing gas flow therefrom; a gas feed conduit connected to said connection conduit for introducing pressure gas thereinto; vent valve means communicating between said first chamber and free atmosphere; a nozzle disposed within each of said first and second chambers and in gas flow communication with said connecting conduit, each nozzle being positioned to direct a jet of pressure gas from said connecting conduit towards a respective said closure flap; level sensing means in the second chamber adjacent to said outlet from the second chamber; control means operatively connected to the shut-off valve means, the vent valve means and the level sensing means and operable, in response to a signal from the level sensing means that the material in the second chamber has fallen to a predetermined level, to actuate the shut-off valve means to an open position and said vent valve means to a closed position for filling the second chamber; and a flow shut-off member for preventing a flow of bulk material to said first chamber inlet when said first closure flap is closed to avoid said first closure flap having to close against the flow of bulk material; and wherein said control means actuates said shut-off member at least substantially in synchronization with said first closure flap.

4,118,076

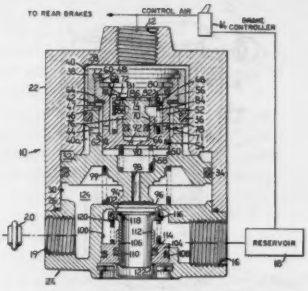
CONTROL VALVE HAVING REDUCED CRACK-OPEN PRESSURE

William M. Mild, Maryland Heights, Mo., assignor to Wagner Electric Corporation, St. Louis, Mo.

Filed Mar. 28, 1977, Ser. No. 781,835

Int. Cl.[2] B60T *8/26*

U.S. Cl. 303—6 C 15 Claims



1. A control valve comprising:

(a) a housing;

(b) said housing being adapted to receive control fluid pressure at a first inlet, fluid pressure at a second inlet and providing brake fluid pressure at an outlet thereof;

(c) control valve means moveable in said housing for controlling the application therethrough of fluid pressure from said second inlet to said outlet upon receipt at said first inlet of control fluid pressure;

(d) differential piston means within said housing, said differential piston means having larger and smaller piston areas in sealing contact with larger and smaller bores in said housing;

(e) means for freely communicating control fluid pressure to said larger piston area at fluid pressures between atmospheric pressure and a first level of control fluid pressure greater than atmospheric pressure;

(f) means for isolating said larger piston area from said control fluid pressure upon the occurrence of said first level of control fluid pressure, whereby a fixed value of fluid pressure equal to said first level is trapped between said larger and smaller piston areas;

(g) means for providing brake fluid pressure in a first predetermined ratio to said control fluid pressure for control fluid pressure between said first and a second, higher level of control fluid pressure; and

(h) means for admitting control fluid pressure in metered amounts between said larger and smaller piston areas at greater than said second level of control fluid pressure higher than said first level of control fluid pressure, whereby brake fluid pressure is provided in a second predetermined ratio higher than said first predetermined ratio.

4,118,077

BRAKING CORRECTION DEVICE

Jean-Jacques Carré, Montreuil, France, assignor to Societe Anonyme D.B.A., Paris, France

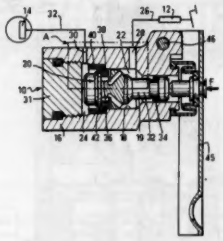
Continuation-in-part of Ser. No. 766,322, Feb. 7, 1977, Pat. No. 4,059,174. This application Aug. 12, 1977, Ser. No. 824,018

Int. Cl.[2] B60T *8/18*

U.S. Cl. 303—6 C 6 Claims

1. Braking correction device having a housing with a bore therein, a stepped piston having a head slidably mounted in the bore of the housing and cooperating with the latter so as to define in said bore an inlet chamber adjoining the piston head face having the smallest effective cross section, and an outlet

chamber adjoining the piston head face having the larger effective cross section, said inlet chamber being adapted to be connected to a source of hydraulic fluid pressure and said outlet chamber being adapted to be connected to at least one brake actuator, said piston head having a peripheral groove in which a ring of elastomeric material is mounted with axial and radial clearance, said ring of elastomeric material cooperating with a portion of the inner surface of said bore to as to open communication between the inlet chamber and the outlet



chamber when the piston is in an idle position and so as to close communication between the inlet and outlet chambers when the piston is moved from its idle position, said portion of the inner surface of the bore comprising a first part defining a fluid tight side wall, and a second part formed of a sleeve of porous material, said second part being adjacent to the outlet chamber, an annular space being provided between the piston head and the sleeve of porous material so as to permit uninhibited fluid communication between the inlet and outlet chambers when the piston is in its idle position.

4,118,078

LINEAR BALL BEARING INCLUDING LONGITUDINAL SLOT IN THE SLEEVE WITH BALL-RETAINING CAGE

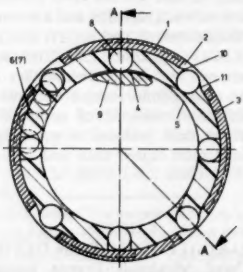
Horst Manfred Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt, and Manfred Brandenstein, Aschfeld, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 21, 1977, Ser. No. 779,693

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612935

Int. Cl.² F16C *29/06, 31/05*

U.S. Cl. 308—6 C **7 Claims**



1. In a linear ball bearing operable with a shaft for relative axial movement therewith, the bearing including an outer sleeve, a cylindrical ball-retaining cage situated within the sleeve, said cage having a plurality of continuous raceways, each of which includes (a) two parallel and axial races, one being a loaded zone wherein balls contact both the sleeve and the shaft, and the other being an unloaded return zone, and (b) two curved turn-around races connecting adjacent ends of said axial races, and a plurality of balls substantially filling said raceways, said unloaded return zone being defined by a slot extending axially in said sleeve and radially through said sleeve, the improvement in combination therewith, wherein said sleeve has a circumferential surface facing said cage, said surface comprising regions adjacent said loaded axial zone and said turn-around races of said cage, and in at least one of said regions said sleeve surface is recessed radially outward from said cage, thereby defining a space between said recessed region and the balls therein, and said cage comprises exclusive ball-restraining means for restraining said balls in said recessed region from contacting said recessed surface of the sleeve.

4,118,079

FLUID BEARINGS WITH CONFORMING SHELLS

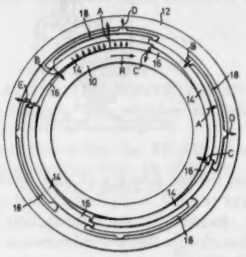
Paul Newman, and Raymond Fredrick Sargent, both of Bristol, England, assignors to Rolls-Royce Limited, Great Britain

Filed May 31, 1977, Ser. No. 801,791

Claims priority, application United Kingdom, Jun. 12, 1976, 24451/76

Int. Cl.² F16C *35/00*

U.S. Cl. 308—9 **15 Claims**



1. In a fluid bearing assembly including a pair of elements mounted for movement relative to each other on a fluid film formed between bearing surfaces formed on a plurality of resilient shells supported at points along their length between said elements and a bearing surface formed on one of said elements, the improvement comprising:

each of said resilient shells being of a thickness which, relative to its other dimensions is such as to prevent said shell from locally deflecting at unsupported positions thereof in response to increases in the pressure of said fluid film, and

means being provided operable in response to increases in pressure in said fluid film to bend each of said shells in the manner of a stiff beam in a controlled manner to modify the shapes of the shells so that the bearing surfaces on the shells conform more closely to the bearing surface of said one element in regions of minimum fluid film thickness.

4,118,080

SEALED ANTIFRICTION BEARING WITH SEALING ELEMENT

Helmuth Kregler, and Reinhard Hillmann, both of Schweinfurt, Germany, assignors to SKF Industries, Inc., King of Prussia, Pa.

Filed Jul. 1, 1976, Ser. No. 701,642

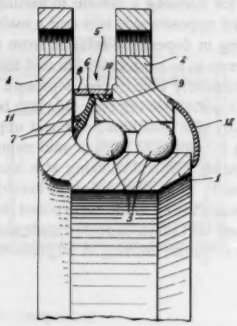
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1975, 7521787[U]

Int. Cl.² F16C *33/76*

U.S. Cl. 308—187.1 **9 Claims**

1. In an antifriction bearing including inner and outer races and corresponding raceways and rolling elements in said raceways, the improvement in combination therewith of sealing means to protect said rolling elements and raceways, wherein said inner race comprises a supporting flange extending generally radially outward, and said outer race has a fastening edge adjacent and axially spaced from said supporting flange, said

sealing means comprises an annular resilient sealing element having a first end engaging said fastening edge and an opposite free end formed as at least one sealing lip which slidably engages said supporting flange of said inner race, and a generally rigid cylindrical casing having a first end overlying said first



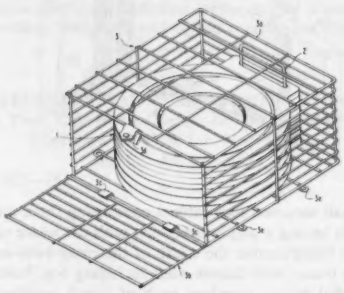
end of the sealing element and securing same to said fastening edge and an opposite second end extending axially toward but not touching said supporting flange and defining therewith a narrow gap, said casing being radially outward of said sealing element for protecting same.

4,118,081

PLATE HOLDER

Christine Ann Barrientos, 996 Hamilton Ave., Seaside, Calif. 93955

Filed Mar. 9, 1977, Ser. No. 775,835
Int. Cl.[2] A47B *81/00*
U.S. Cl. 312—8 **7 Claims**



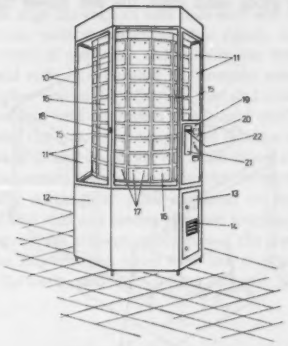
1. A plate holder for use in leisure time vehicles such as campers, trailers, and the like, comprising a housing, a vertically disposed post mounted in said housing, a plurality of carriers slidably mounted in stacked relationship on said post, each carrier having an aperture through which said post extends, each carrier adapted to support a respective plate, the plates being interleaved the carriers such that the bottom surface of each plate is supported by the top surface of a carrier and the top surface of each plate supports the bottom surface of the next adjacent carrier, whereby the stacked plates are protected against damage while the vehicle is moving; a side wall of the housing providing an access to the interior of the housing whereby a plate may be removed laterally from the stack while the post retains the carriers within the housing wherein the post being spaced inwardly from a wall of the housing and secured to the base thereof.

4,118,082

ADVERTISEMENT PILLAR

William J. Hoop, Eschen, Liechtenstein, assignor to Gamperdona Handels- und Finanz Aktiengesellschaft, Liechtenstein

Filed Sep. 13, 1976, Ser. No. 722,755
Claims priority, application Switzerland, Mar. 24, 1976, 3446/76; May 10, 1976, 5827/76
Int. Cl.[2] A47B *49/00*
U.S. Cl. 312—59 **7 Claims**



1. An advertising and information display column for publicly displaying on streets and in public squares a plurality of advertisements said display column comprising an outer housing having upper and lower portions, said upper portion including frame means for supporting a plurality of sidewalls a plurality of which are comprised of a transparent material, one of said plurality of sidewalls comprising a lockable door adapted to be opened outwardly, a card vending means attached to said door for vending a blank advertising card in response to a predetermined signal, said upper portion further including a card collection means for collecting the previously vended cards following the placement of advertising thereon so that the cards will be available in said display column for subsequent display therein, an inner card display member rotatably mounted to said lower portion and within said upper portion so that said display member is spaced inwardly of the sidewalls forming the upper portion of said outer housing, said inner card display member having a plurality of sides each side having a plurality of card holding means for holding the vended cards which had been collected in said card collection means so that the cards will be visible through the transparent sidewalls of the upper portion, electric drive means mounted within said lower portion and being drivingly connected to said inner card display member for rotating said member said lower portion having a lockable door to provide access to said electric drive means and drive control means positioned on the exterior of said outer housing for controlling the operation of said drive means and the rotation of said inner card display member.

4,118,083

CABINET BASE CONSTRUCTION FOR ROOF TOP AIR CONDITIONER

Robert S. Lackey, Pittsburgh; Robert R. Young, and John C. Kastovich, both of Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

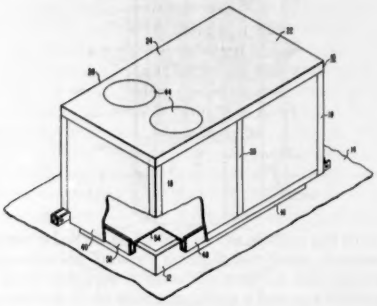
Filed Nov. 23, 1977, Ser. No. 853,988
Int. Cl.[2] F25D *19/00*; E04B *7/18*
U.S. Cl. 312—100 **4 Claims**

1. A cabinet base construction for an air conditioning unit of the type adapted for a roof top or slab installation and having an outdoor air flow section and a separate indoor air flow section, comprising:

a substantially rectangular frame comprised of a base rail

along each opposite side and along each opposite end, each base rail having a shape in transverse cross section including an upwardly open channel formed of an outer leg, a web, and an inner leg, the outer leg having a height greater than said inner leg, and the inner leg having a horizontal flange projecting inwardly from along the top of the inner leg;

separate pan means forming the bottom wall for the separate outdoor air flow section and indoor air flow section, each pan means including a horizontal wall and an upturned flange along each edge, the pan means together being



dimensioned to nest in the perimetric area defined by the inner faces of said outer legs of the frame, with the upturned flanges along the outer edges of the pan means abutting that upper marginal portion of the frame outer legs projecting above the height of the top of the frame inner legs, and with the upturned flanges of said pan means which extend from side to side intermediate the ends of the frame being in abutting relation; and

said upturned flanges being spot-welded to the abutting members and the horizontal wall of said pan means being spot-welded to said horizontal inturned flanges of said inner legs.

4,118,084

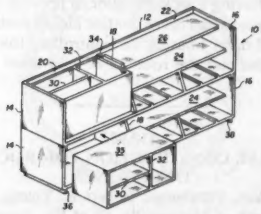
STACKABLE COMPARTMENTALIZED STRUCTURE FOR COSMETICS OR THE LIKE

Howard Sussman, c/o Crackerbarrel Marketing, E. Shore Rd., Huntington, N.Y. 11743

Continuation-in-part of Ser. No. 797,304, May 16, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,249

Int. Cl.[2] A47B *87/00*

U.S. Cl. 312—107 **3 Claims**



1. A compartmentalized structure for storing cosmetics or the like having an improved construction permitting vertical stacking with structures similarly constructed, said structure comprising a vertically oriented rear wall, a cooperating arrangement of two opposite side walls and a medial wall connected to extend forwardly from said rear wall at locations adjacent the opposite sides thereof and at an intermediate location, first and second horizontally oriented top shelf panels positioned to extend in spanning relation from opposite sides of said medial wall to said side walls at a level slightly below the upper edges of said rear, opposite side, and medial walls so as to cooperate therewith in bounding an upper mounting recess for said structure, said upper edge of said medial wall in said mounting recess having a section removed therefrom adjacent said rear wall for forming a female mounting notch, and an inwardly located opposite side legs and a male mounting projection extending in depending relation from the bottom wall of said structure so as to project within said mounting recess of a cooperating similarly constructed structure in a supporting position beneath same, said opposite side legs being at locations to assume side-by-side positions with said upper edges of the walls bounding the opposite sides of said mounting recess and said male mounting projection being at a location to project within said female mounting notch, whereby said side legs minimize sidewise shifting in the superposed structures relative to each other and said interconnected male and female projection and notch minimize shifting in all remaining directions.

4,118,085

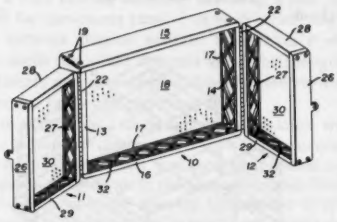
WALL MOUNTED TOOL CABINET

C. Kenneth Fibus, Youngstown, Ohio, assignor to The Steel City Corporation, Youngstown, Ohio

Filed Jun. 13, 1977, Ser. No. 805,827

Int. Cl.[2] A47F *5/08*

U.S. Cl. 312—245 **4 Claims**



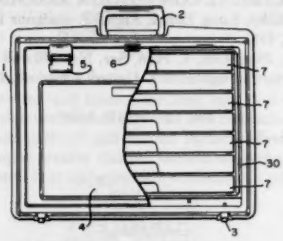
1. A wall mounted tool cabinet comprising three units, said units each having a width dimension with the width of one of said units being double the width of the outer two, each unit having a frame, said frames each including top, bottom and side molded plastic members each of which members has a peripheral flange and a continuous channel therein adjacent one edge thereof, said frame members being arranged at right angles with respect to a wall, a flat rectangular panel positioned in each of said frames with its peripheral edges engaged in said continuous channels, each of said frames comprising four molded plastic frame members abutting one another at their ends, means securing said frame members to one another with said frame members being positioned about said flat rectangular panel so as to continuously engage and cage said panel in said continuous channel, integral hinge configurations on each of said units for mutual movable engagement and arranged so that said two of said units can move into covering relation with said one double width unit to form closures therefor, said bottom frame members each including a crisscross molded integral reinforcing grid structure with the grids thereof defining a plurality of receptacles of each unit in which items, such as fasteners and the like, may be stored.

4,118,086

TACKLE BOX

Joseph William Kneier, Chesterland, Ohio, assignor to Flambeau Products Corporation, Baraboo, Wis.

Filed May 12, 1977, Ser. No. 796,422
Int. Cl.[2] A47B *51/00*
U.S. Cl. 312—270 12 Claims



1. A tackle box comprising:

a boxlike container having relatively rigid sides, top, bottom, and back;

means for access to the interior of said container at its front;

means for vertical support disposed on the interior of said container sides;

means for horizontal guide extension disposed on said means for vertical support and having an end facing said means for access;

drawer trays disposed in said means for horizontal guide extension whereby said drawers are supported and movable from a position substantially internal to said container for storage to a position substantially external to said container for selection of drawer contents; and

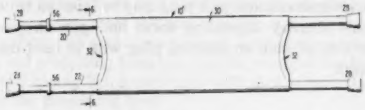
said means for horizontal guide extension being retained on said means for vertical support by a fixed stop at the back of the container and retainer bar means at the front of the container and extending in overlying relationship to said end of said means for horizontal guide extension, said retainer bar means including means on said container for permitting ready removal of said retainer bar means.

4,118,087

RECREATIONAL VEHICLE SHELF BARS

Helen A. Dorf, 5265 Home Gardens Dr., Reno, Nev. 89502

Filed Nov. 26, 1976, Ser. No. 745,412
Int. Cl.[2] A47B *81/00*
U.S. Cl. 312—291 1 Claim



1. A retainer for articles normally disposed within a vehicle storage enclosure having opposed, side walls, a back wall and at least one shelf member for supporting articles within said enclosure on said shelf member against relative movement thereof, said retainer comprising:

a pair of mutually spaced, biased telescoping rods, each of said rods mounting a skid resistent foot at either end thereof, each of said rods comprising an outer tube and an inner tube, an end portion of said outer tube receiving an end of said inner tube, and a coil spring extending through said outer tube, through the end portion of said inner tube received therewithin and into the central portion of said inner tube;

means carried by each of said rods for changing the length thereof so that said feet lie a predetermined distance apart, said means comprising a first crimp on said outer tube adjacent the foot mounted thereon, engaging an end of said spring, and a second crimp on said inner tube adjacent the end received within outer tube whereby rotation of said inner tube relative to said outer tube will alter the distance between said feet, said spring normally urging the ends thereof outwardly to dispose said feet at said predetermined distance whereby when said distance is greater than the distance between opposed faces of said sidewalls and said rods are disposed within said enclosure, said spring will urge the ends of said rods into said walls;

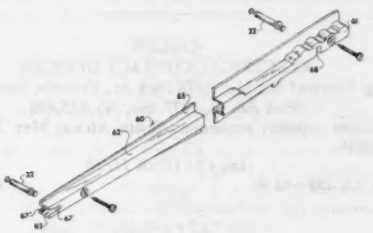
and at least one vertical spacer member rigidly connecting the outer tube of said rods and spacing the longitudinal axes of said rods in a parallel relationship, substantially close together one to the other, so that said retainer may be inserted into said enclosure above said shelf member and abutting the articles to be retained thereon to confine the articles with said enclosure back and side walls against relative movement thereof, said spacer member being a substantially rectangular plate mounted on the central portion of said rods and having opposed longitudinal edge portions wrapped, respectively, around the central portion of the adjacent rod outer tube and transverse edge portions between said rod folded toward the center thereof.

4,118,088

KNOCK-DOWN FURNITURE SYSTEM

John M. Dunning, III, Greensboro, N.C., assignor to Dunning, Ltd., Greensboro, N.C.

Filed Jun. 6, 1977, Ser. No. 803,988
Int. Cl.[2] A47B *88/04*
U.S. Cl. 312—350 3 Claims



1. Improvements in a knock-down furniture system of the type in which a plurality of holes are arranged in a pair of horizontally spaced, vertical rows adjacent the front and rear edge of the side walls thereof and receive connecting pins having a head and reduced neck portion which extend outwardly from at least one surface of the side walls and onto which various hardware and connecting fixtures are attached, said improvements comprising:

(a) at least a pair of drawer slides each having a front and rear end and releasably attached to a laterally spaced pair of said pins;

(b) said drawer slide including an elongated body member having a longitudinally elongated slot opening toward the rear end thereof and a transversely extending elongated slot opening at the bottom of said body member adjacent the front end thereof;

(c) whereby said drawer slide may be releasably secured to said side wall by moving the slide rearwardly while sliding said rear slot onto the pin at said rear, then pivoting said slide downwardly into locking engagement with the corresponding pin at said front side.

4,118,089

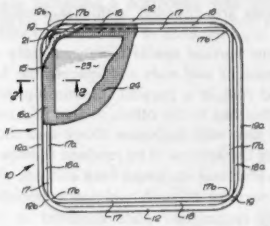
FURNITURE DRAWER

Jerry Lynn Johnson, Portrero, and Martin R. Liebhold, Los Angeles, both of Calif., assignors to Landes Manufacturing Co., Los Angeles, Calif.

Filed May 9, 1977, Ser. No. 794,950

Int. Cl.[2] A47B *88/00*

U.S. Cl. 312—351 **7 Claims**



1. A drawer for use in furniture defining drawer support slides, comprising

(a) a frame defining generally parallel peripheral guide rails cooperating with said support slides whereby the drawer may be advanced and retracted, and

(b) a basket having flexible walls supported by and hanging from said frame, whereby the basket may be collapsed upwardly toward a plane defined by the frame,

(c) the frame including elongated members which are spaced from said guide rails to define elongated slots, there being loops on the basket wall portions received through said slots, and there being retainers removably received in said loops and cooperating therewith to block retraction of the loops through the slots, said walls extending over said elongated members,

(d) said slots included within at least three elongated slots defined by the frame.

4,118,090

ELECTRICAL CONTACT DEVICES

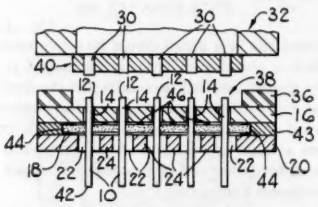
Luigi Giovanni Del Mei, 1178 Park St., Pretoria, South Africa

Filed Jul. 14, 1977, Ser. No. 815,498

Claims priority, application South Africa, May 23, 1977, 77/3036

Int. Cl.[2] H01R *11/30*

U.S. Cl. 339—12 R **12 Claims**



1. A device comprising:

a plurality of movable electrically conductive contact means;

at least one contact surface on each of said contact means, said contact means being movable independently by application of forces to said contact surfaces;

locating means defining guide paths receiving said contact means for guiding the contact means during movement resulting from application of forces to said contact surfaces;

elastomeric biassing means engaging said contact means for biassing said contact means to oppose forces applied to said contact surfaces, said biassing means comprising electrically insulating elastomeric material; and

means for restraining said contact means from leaving said guide paths comprising connections between said contact means and said elastomeric biassing means.

4,118,091

ELECTRICAL CONNECTION ASSEMBLIES

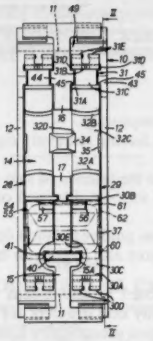
Reg Alan Frisby, Long Eaton, England, assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 7, 1976, Ser. No. 730,668

Claims priority, application United Kingdom, Oct. 8, 1975, 41213/75

Int. Cl.[2] H01R *3/06*

U.S. Cl. 339—14 R **35 Claims**



1. An input connection assembly comprising a holder of an electrically insulating material; said holder having two ends and defining a well intermediate its ends, in which well are accommodated in a tandem manner an input terminal member disposed at one end of the holder, an output terminal member disposed at the opposite end of the holder, and between those two terminal members an intermediate connection member having oppositely-disposed contact-making parts which make electrical contact with opposing contact-making parts of the respective terminal members so as to provide a continuous current conducting path between the input and output terminal members, said contact-making parts comprising at least two separable elements which normally press resiliently against one another for so completing such path between said intermediate connection member and one of said terminal members, at least one of said elements being resiliently movable for deflection from the respective opposing element whereby an electrical test or interconnection jack plug may be inserted between said elements thereby separating them and providing electrical connection of such an inserted plug with at least one of said members.

4,118,092

INTERCONNECTORS

Ryoichi Sado, Saitama, and Kazutoki Tahara, Omiya, both of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1977, Ser. No. 806,057

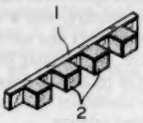
Claims priority, application Japan, Jun. 14, 1976, 51-69557

Int. Cl.[2] H05K *1/04*

U.S. Cl. 339—59 M **5 Claims**

1. An interconnector comprising an elongated strip of an electrically insulating silicone rubber having a pair of oppositely directed lateral surfaces and a plurality of contacts each shaped as a parallelopipedon and formed of an electrically conductive silicone rubber, said contacts arranged in a row extending in the elongated direction of said strip and secured to and projecting laterally outwardly from one of the lateral

surfaces of said strip, each of said contacts having a first surface parallel with and contacting the lateral surface of said strip, a second surface parallel with said first surface and spaced outwardly from said first surface, and side surfaces



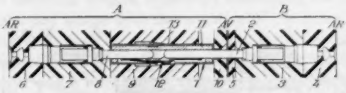
extending between and interconnecting said first and second surfaces, the side surfaces of adjacent said contacts disposed in spaced relation, each of said second surfaces of said contacts having a straight groove formed therein with the groove extending between two opposed side surfaces of said contact.

4,118,093

ELECTRICAL CONNECTORS

Albert Obéissart, Boulogne-Billancourt, France, assignor to Souriau & Cie, Boulogne-Billancourt, France

Filed Mar. 15, 1977, Ser. No. 777,643
Claims priority, application France, Mar. 17, 1976, 76 07753; Jun. 24, 1976, 76 19275; Oct. 6, 1976, 76 30111
Int. Cl.[2] H01R *7/06, 13/54*
U.S. Cl. 339—75 M **31 Claims**



1. In an electrical connector comprising first and second connector units, first and second insulating body means located in said first and second connector units respectively, a plurality of female contacts of socket type carried by said first insulating body means, and a plurality of corresponding male contacts of pin type carried by said second insulating body means, each female contact comprising an external casing and a longitudinal part, said longitudinal part being formed of a radially movable piece, control means acting on said movable piece so that said movable piece can be placed on the one hand in a deflected position for which the introduction or the withdrawal of the corresponding male contact is made with a weak or zero pressing-force and, on the other hand, in a gripped position for which said movable piece is pressed against said male contact, the pressure exerted by said movable piece being obtained at the end of the introduction of the male contacts into the female contacts, the improvement that said movable piece is provided, for cooperation with said control means, with a boss extending outwards and projecting from the external casing of the female contact, said casing being provided with an aperture for the passage of the projecting boss.

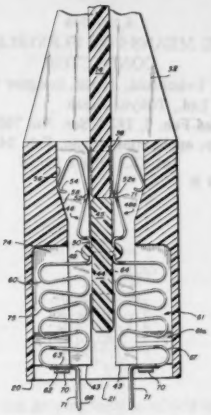
4,118,094

ZERO-ENTRY FORCE CONNECTOR

Edward H. Key, Wheaton, Ill., assignor to TRW Inc., Elk Grove Village, Ill.

Filed Mar. 31, 1977, Ser. No. 783,152
Int. Cl.[2] H01R *13/54;* **H05K** *1/07*
U.S. Cl. 339—75 MP **14 Claims**

1. A zero entry force connector including a connector housing, a reciprocable carrier disposed in said housing, a plurality of contact strips each having a first end portion thereof attached to said housing, an intermediate portion formed into a smooth, rounded contact portion laterally movable within said housing, and a second end portion coacting with said housing for moving said contact portion laterally to effect electrical contact with an inserted element as said carrier is moved inwardly of said housing, and each of said contact strips forming a compression spring between said first end portion and said



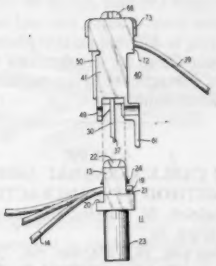
intermediate portion which is compressed as said carrier is so moved to thereupon urge said carrier outwardly of said housing.

4,118,095

WIRE CONNECTING BLOCK

Richard Newman Berglund, Bridgewater, and John Paul Pasternak, Whippany, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 6, 1977, Ser. No. 813,306
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—99 R **20 Claims**



1. Apparatus for electrically interconnecting first conductors with associated second conductors comprising:

first and second mating connectors made of an electrically insulative material, said first connector having provision therein for individually receiving and indexing said first conductors, ends of which are exposed along one side of said first connector;

a plurality of slotted beam contacts;

means, integral with said second connector, for holding said slotted beam contacts in a predetermined spatial relationship wherein said slotted beam contacts are engageable with said first and second conductors, respectively; and

means, integral with said second connector, for encasing said exposed ends of said first conductors to electrically isolate them from one another, said encasing means comprising a generally L-shaped skirt integral with and projecting away from said second connector, said integral skirt being scalloped along the base of said generally L-shape, the

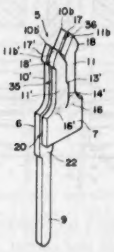
scallops engaging said first conductors and holding them in place between said first and second connectors.

4,118,096

CONNECTING MEANS FOR FLEXIBLE FLAT CABLE CONNECTOR

Toru Takahashi, Yokohama, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1977, Ser. No. 765,001
Claims priority, application Japan, Feb. 14, 1976, 51-14411
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—99 R **5 Claims**



1. A connecting means for use in an electrical connector for making electrical contact with a multiconductor flexible flat cable comprising:

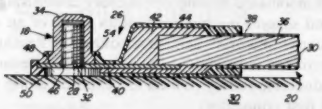
two pairs of contact tines, said tines in each pair joined at the lower ends thereof and separated by a U-shaped crotch adapted for accomodating one conductor of a multiconductor flexible flat cable and a narrow slit extending downwards from said U-shaped crotch and having a uniform width, the bottom of said slit being the bottom of the space between said tines, said U-shaped crotch having a bottom portion adapted for receiving one conductor of a multiconductor flexible flat cable and said slit having a width dimension less than that of the cable for preventing the conductor from entering into said narrow slit, each of said tines lying in different parallel planes offset in a direction perpendicular to the length of said tines whereby said two pairs of contact tines have a partially facing mutually staggered relationship.

4,118,097

BATTERY CABLE TERMINAL ASSEMBLY AND METHOD OF MANUFACTURE

Lawrence T. Budnick, St. Charles, Ill., assignor to Altek Systems, Inc., Aurora, Ill.

Filed Dec. 29, 1976, Ser. No. 755,500
Int. Cl.[2] H01R *11/06*
U.S. Cl. 339—232 **13 Claims**



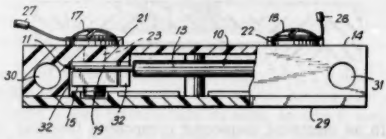
1. A cable terminal assembly for use in establishing a connection between a conductor cable and a battery terminal of the type comprising a metal base and a threaded stud projecting upwardly from the base, the improvement comprising, in combination, a conductive metal terminal plate arranged so that one end thereof underlies an exposed end of said conductor, an aperture formed in the opposite end of said terminal plate to receive said stud member, connecting means connecting said conductor and terminal plate to form both a mechanical and electrical connection therebetween, an insulator jacket substantially covering said connecting means and said terminal plate, said insulator jacket having openings formed therein above and below said aperture in said plate, said openings being larger than said plate aperture to expose a portion of said plate surrounding said aperture, and a raised wall member formed integral with said jacket and surrounding the opening above said plate aperture, said opening below said plate aperture being dimensioned to receive said wall member to permit a plurality of said cable assemblies to be stacked one above the other in closely interfitted relation.

4,118,098

CONNECTOR FOR REED SWITCHES

James L. Swift, Staten Island, N.Y., assignor to American District Telegraph Corporation, Jersey City, N.J.

Filed Jan. 14, 1977, Ser. No. 759,254
Int. Cl.[2] H01R *9/10*
U.S. Cl. 339—263 R **1 Claim**



1. A switch connector comprising:

a non-conducting connector base;

connective means for contacting each electrical lead of a switch and substantially preventing the deformation of said base local to said electrical lead, said connective means being of sufficient hardness to substantially resist deformation local to said electrical leads and at least a portion of said connective means in contact with each said electrical lead being electrically conductive to provide a terminal for external circuit connection for said lead;

clamping means for engaging said base and connective means to mount said switch on said base and to maintain said connective means in contact with each said electrical lead, said clamping means comprising a pair of threaded members and threaded mates thereof, each of said threaded members extending through channels in said base, through said connective means for each lead and through said mates such that thread advance through said mate provides a clamping force to mount said switch on said base and to maintain said connective means in contact with each said lead;

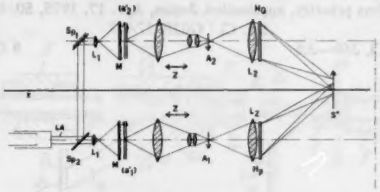
shoulders formed in said non-conducting connector base and positioned to engage the threaded mates to prevent them from turning during thread advance of the threaded members through the respective mates thereof; and

a cover affixable to said connector base for substantially enclosing and protecting the switch, said electrical leads of the switch, said threaded mates and a portion of said threaded members, said cover further acting in combination with said shoulders in the base to hold said threaded mates in alignment with said channels in said base when said threaded members are withdrawn, to facilitate reassembly of the connector.

4,118,099
IMAGE CODING AND DECODING USING COHERENT CODES

Hermann Weiss, Hamburg; Erhard Klotz, Halstenbek, and Ulf Tiemens, Pinneberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 5, 1976, Ser. No. 711,712
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1975, 2535408; Nov. 29, 1975, 2553869
Int. Cl.[2] G02B *27/00*
U.S. Cl. 350—3.73 **6 Claims**



1. A method of imaging a three-dimensional object with the aid of coding and decoding using coherent point codes, comprising recording the object with a plurality of radiation sources of different orientations on a recording medium, recording the object again separately with a second plurality of differently oriented radiation sources, forming the negatives of the two recorded images, separately combining the positive of each recorded image with the negative of the other image, to form two combined images, multiplying the combined images by means of point holograms formed with the aid of a reference wave and a multiplicity of light sources whose co-ordinates correspond to those of the point images of the two source arrays recorded by a pinhole camera, superimposing the two multiplied images in one plane, and decoding the coded images by changing their scale with the aid of two synchronously controlled zoom lenses whereby the co-ordinates of the point image function of an image of an object layer in the coded images are adapted to the points stored in the two point holograms.

4,118,100
OPTICAL COUPLERS FOR LIGHT EMITTING DIODES AND DETECTORS

James E. Goell, Roanoke, Va., and H. David Brandt, Hamilton, Mass., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

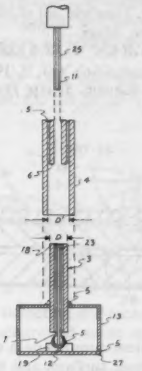
Filed Dec. 10, 1975, Ser. No. 639,544
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.20 **11 Claims**

1. A coupler for connecting an optical fiber to an electro-optical element in an optical communication system, comprising:

a first optical fiber having a first end fixedly coupled to said electro-optical element, and having a polished second end;

a first hollow tube for housing said first fiber, said hollow tube having an outer diameter; and

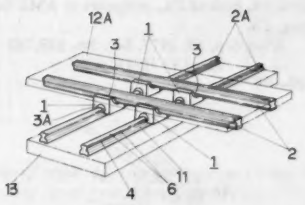
a second hollow tube having a first inner diameter at a first end thereof, said first inner diameter substantially equal to said outer diameter so that said second hollow tube may slidably engage and pass over said first hollow tube, said second hollow tube having a second smaller inner diameter at a second end thereof for slidably receiving said optical fiber and guiding the end of said optical fiber to the polished end of said first optical fiber.



4,118,101
DOUBLE SLIDE WAY BEARING INCLUDING RECIRCULATING BALL BEARINGS

Hiroshi Teramachi, 2-34-9 Higashi-Tamogawa Setagaya-ku, Tokyo, Japan

Filed Sep. 30, 1977, Ser. No. 838,144
Claims priority, application Japan, Sep. 30, 1976, 51/116501
Int. Cl.[2] F16C *29/06*
U.S. Cl. 308—6 C **7 Claims**



1. A double slideway bearing assembly capable of resisting torsional forces incurred in predetermining positioning a relative heavy workpiece at a given point in a plane comprising at least one bearing block, said bearing block having opposed surface portions, a rail groove formed in each of said opposed surface portions, said rail grooves being disposed at an angle to one another, an elongated rail bed disposed in each of said rail grooves whereby said rail beds are disposed at an angle relative to each other, said rail grooves and its associated rail bed having complementary bearing surfaces to define at least a pair of oppositely disposed bearing races, a plurality of ball bearings disposed on each of said opposed bearing races, a retainer means disposed between the surface of said rail grooves and associated rail bed for retaining said ball bearings therebetween, said retaining means and respective rail groove having opposed complementary bearing portions to define a return raceway, said return raceway defining with said first mentioned bearing races a continuous endless raceway for said ball bearing whereby the ball bearing in said bearing races are loaded and the ball bearing in said return raceway are non-loaded whereby said rail beds are rendered respectively movable relative to said bearing block and to each other.

4,118,102

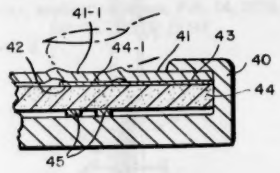
ISOLATED PATH COUPLING SYSTEM

Charles H. Kuist, Newburyport; Vincent Squitieri, Billerica, and Richard E. Seeger, Topsfield, all of Mass., assignors to Chomerics, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 479,668, Jun. 17, 1974, Pat. No. 4,065,197. This application Apr. 3, 1975, Ser. No. 564,710

Int. Cl.[2] H01R *13/00*

U.S. Cl. 339—17 F **3 Claims**



1. A coupling system comprising a sheet of plastic material having top and bottom surfaces and having electrically conductive particles homogeneously dispersed therethrough, said sheet having means for providing at least when uncompressed a low electrical through resistance between opposite aligned points on said top and bottom surfaces and a plurality of spaced apart electrically conductive material elements supported by and adhered to and in surface electrical contact with the same surface of said sheet, said conductive elements being spaced apart on said surface of said sheet at least a distance apart equal to about the thickness of the sheet so that they are electrically isolated from each other by an isolation resistance greater than about 1000 ohms and in which the volume percent of conductive particles is between about 20 volume percent to 0.05 volume percent.

4,118,103

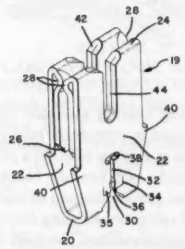
DOUBLE-ENDED CONNECTING DEVICE

James Albert Leidy, Harrisburg, and Gary Douglas Porta, Shiremanstown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 15, 1977, Ser. No. 833,783

Int. Cl.[2] H01R *9/08*

U.S. Cl. 339—98 **9 Claims**



1. A double-ended electrical connecting device which is intended to receive a wire at each end thereof thereby to connect said wires to each other:

said connecting device having a U-shaped cross section comprising a web and sidewalls extending from said web, said sidewalls being reversely folded inwardly towards each other and towards said web whereby each of said sidewalls comprises inner and outer thickness of metal stock extending from the free ends of said sidewalls partially towards said web,

a first wire-receiving opening in said web and a first wire-receiving slot in each of said sidewalls extending from said opening partially into said sidewalls,

each of said sidewalls having a second wire-receiving slot extending inwardly from its free end in both of said metal thicknesses towards said web whereby,

said wires are electrically connected to each other upon relative movement of said wires laterally of their axes into said first and second wire-receiving slots.

4,118,104

SPLIT HOLOGRAM AND METHODS OF MAKING AND USING SAME

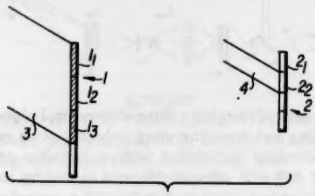
Yasuo Yamada, and Masao Seki, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1976, Ser. No. 659,971

Claims priority, application Japan, Apr. 17, 1975, 50/45813

Int. Cl.[2] G02B *27/00*

U.S. Cl. 350—3.6 **9 Claims**



1. A holographic recording method for making a split hologram of an illuminated object from a holographic sensitive recording member, said method comprising the steps of

segmenting the illuminated object into a plurality of single object segments,

segmenting the holographic sensitive recording member into a plurality of single recording segments respectively corresponding to said plurality of single object segments, said recording segments being successively disposed on said holographic sensitive recording member from a first one to a last one of said single recording segments,

recording a plurality of different adjacent object segments of said illuminated object onto successive single recording segments of said holographic sensitive recording member where each plurality of different adjacent object segments recorded onto one of said single recording segments, after the first plurality of different adjacent object segments are recorded on said first of said single recording segments, includes the unrecorded object segment adjacent the last recorded plurality of adjacent object segments

whereby said split hologram is formed, the split hologram having a plurality of portions respectively corresponding to said plurality of recording segments of the holographic sensitive recording member.

4,118,105

OPTICAL COUPLING

K. J. Voigt, Fürstenfeldbruck, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschft zur Forderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed Jun. 18, 1976, Ser. No. 697,692

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1975, 7519901[U]

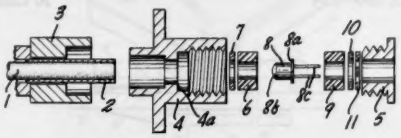
Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.20 **11 Claims**

1. In an optical coupling including a socket, in which an electro-optical element having a housing, a circumferential flange about the housing, a lens in one end of the housing and conductors protruding from the other end of the housing is mounted, the socket having an axial bore therethrough from one end to the other end, an internally threaded portion at one end of the socket and an internal shoulder extending into the bore between the ends of the socket; mounting means cooperating with the threaded portion of the socket for removeably

mounting the electro-optical element in the socket, whereby the electro-optical element may be replaced and optimum focusing and light-transmitting efficiency may be obtained; and a plug, in which a light-conducting element is fastened coaxially, mateably engaging the other end of the socket in such a manner that the electro-optical element and the light-conducting element are optically connected, the improvement comprising:

resilient means located in the bore of the socket between the internal shoulder and the mounting means and sandwiched between the socket and the electro-optical element for insulating and self-centering the electro-optical



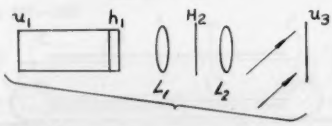
element in the socket, the resilient means including a first insulating ring positioned in the bore of the socket at the one end thereof, one end of the first insulating ring abutting the internal shoulder of the socket and the other end of the first insulating ring abutting the side of the circumferential flange of the electro-optical element nearest the one end of the housing of the electro-optical element, and a second insulating ring positioned in the bore of the socket at the one end thereof, one end of the second insulating ring abutting the side of the circumferential flange of the electro-optical element nearest the other end of the housing of the electro-optical element.

4,118,106

FIBER OPTIC PHASE CORRECTION USING HOLOGRAMS

Emmett N. Leith, Plymouth, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Aug. 2, 1976, Ser. No. 710,581
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.25 **5 Claims**



1. A phase corrected fiber optic bundle comprising:

a fiber optic bundle having an input face and an output face;

a fiber length holographic phase corrector plate positioned at said output face of said fiber optic bundle, said corrector plate consisting of a hologram produced by a recording of the interference pattern between a reference wave with the output from said fiber optic bundle produced by a plane wave input thereto;

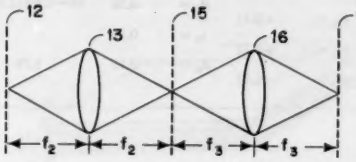
a modal holographic phase corrector plate placed at a plane which displays the Fourier transform of a field at the output of said fiber optic bundle, said modal corrector plate comprised of a hologram formed with said fiber length corrector plate in place and consisting of a recording of the interference pattern between the Fourier transform of the output field generated by an input waveform which excites multi-modal propagation through said fiber optic bundle, and a reference wave, at a plane displaying said Fourier transform.

4,118,107

OPTICAL DETECTION OF GEOMETRIC CONFIGURATIONS

George B. Parrent, Jr., Carlisle, and John H. Ward, Billerica, both of Mass., assignors to Technical Operations, Incorporated, Boston, Mass.

Filed Jan. 19, 1966, Ser. No. 521,750
Int. Cl.² G02B 5/18
U.S. Cl. 350—162 SF **9 Claims**



1. A spatial filter for detecting and locating a selected object configuration from background noise in a recorded image comprising:

(a) an amplitude filter that is a (photographic) negative of the Fourier transform of an object corresponding to said selected object configuration and

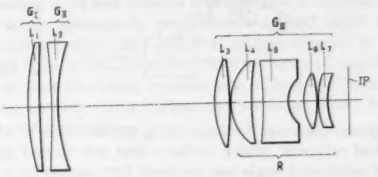
(b) a phase filter that provides π phase reversals for alternate amplitude waves of said Fourier transform.

4,118,108

ZOOM OBJECTIVE, ESPECIALLY FOR A PROJECTOR

Trude Muszumanski, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Aug. 10, 1976, Ser. No. 713,221
Claims priority, application Austria, Aug. 11, 1975, 6228/75
Int. Cl.² G02B 15/14
U.S. Cl. 350—184 **9 Claims**



1. A varifocal objective consisting of an axially fixed positively refracting front component, an axially shiftable negatively refracting intermediate component, and an axially fixed positively refracting rear component constituted by an object-side first positive lens and an image-side positively refracting multilens group; said multilens group comprising a second positive lens, a third positive lens, and a negative lens between said second and third positive lenses; said front component L_1, said intermediate component L_2, said first positive lens L_3, said second positive lens L_4, said negative lens L_5 and said third positive lens L_6 having radii of curvature r_1–r_{12}, axial thicknesses d_1–d_6, separations s_1–s_5, refractive indices n_d and Abbe numbers ν_d substantially as given in the following table:

					n_d	ν_d
L_1	$r_1 =$	+3.24	$d_1 =$	0.19	1.50	67
	$r_2 =$	+18.05				
			$s_1 =$	0.14 f_{min} – 2.00 f_{max}		
L_2	$r_3 =$	−12.19	$d_2 =$	0.09	1.65	56
	$r_4 =$	+2.37				
			$s_2 =$	2.22 f_{min} – 0.35 f_{max}		
	$r_5 =$	+1.39				

-continued

					n_d	ν_d
L_3	$r_6 =$	-6.61	$d_3 =$	0.22	1.60	61
			$s_3 =$	0.01		
L_4	$r_7 =$	$+0.76$	$d_4 =$	0.31	1.64	60
	$r_8 =$	$+3.66$	$s_4 =$	0.12		
L_5	$r_9 =$	-5.00	$d_5 =$	0.38	1.81	25
	$r_{10} =$	$+0.41$	$s_5 =$	0.18		
L_6	$r_{11} =$	$+0.72$	$d_6 =$	0.19	1.79	47
	$r_{12} =$	-1.67				

4,118,109

OPTICAL APPARATUS FOR CONTROLLING THE DIRECTION OF A BEAM OF OPTICAL RADIATION

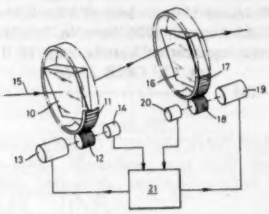
Ian Drummond Crawford, Edinburgh; Henry Bruce Marshall, West Linton, and Robert John Cormack, Edinburgh, all of Scotland, assignors to Ferranti Limited, Hollinwood, England

Filed Jan. 26, 1977, Ser. No. 762,928

Claims priority, application United Kingdom, Jan. 31, 1976, 03904/76

Int. Cl.[2] G02B *5/04*

U.S. Cl. 350—285 **4 Claims**



1. Optical apparatus for controlling the direction of a beam of optical radiation, which includes first and second prisms, each of small apex angle and mounted for rotation on a common axis in the planes bisecting their apex angles substantially parallel to one another and normal to said common axis, drive means operable to rotate each prism independently about said common axis, pick-off means operable to determine the angular position of each prism relative to a datum direction and to deliver outputs representing the sine and cosine of the angles between the datum direction and the orientation of each prism, and control means responsive to said outputs to derive the changes in said angles necessary to move the output beam to a position determined by azimuth and elevation demand inputs, the changes being defined by the expressions

$$d\alpha = \frac{-(dE\cos\beta + dA\sin\beta)}{\sin(\alpha - \beta)}$$

and

$$d\beta = \frac{(dE\cos\alpha + dA\sin\alpha)}{\sin(\alpha - \beta)}$$

where

α is the angular displacement between the first prism and the datum,

β is the angular displacement between the second prism and the datum, $d\alpha$ and $d\beta$ are the respective changes in the angles α and β,

$$dA = A'/k - (\sin\alpha + \sin\beta),$$

$$dE = E'/k - (\cos\alpha + \cos\beta),$$

A' is the azimuth demand input and E' is the elevation demand input,

and k is the deviation produced by each prism.

4,118,110

PASSIVE ELECTRO-OPTIC DISPLAY CELL AND METHOD FOR MANUFACTURING IT

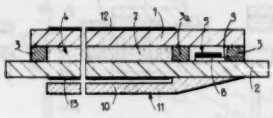
Eric Saurer, Bevaix, and Claude Laesser, La Chaux-de-Fonds, both of Switzerland, assignors to Ebauches S.A., Switzerland

Filed Feb. 7, 1977, Ser. No. 765,954

Claims priority, application Switzerland, Feb. 25, 1976, 2312/76

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—334 **10 Claims**



1. An electro-optic display cell comprising, a pair of transparent plates maintained in facing relationship at a distance one with respect to the other, electrodes deposited on the inner-facing faces of said plates, a display medium located between said electrodes, at least a portion of the inner-facing surface of at least one said plate forming the inner surface of a tightly sealed completely enclosed first compartment, an incandescent lamp contained within the first compartment for providing illumination to the cell, the completely enclosed first compartment forming the enclosure of said lamp.

4,118,111

ELECTRO-OPTIC PASSIVE DISPLAY DEVICE AND METHOD FOR ITS MANUFACTURE

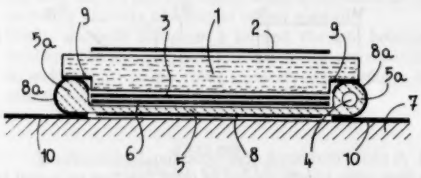
Claude Laesser, La Chaux-de-Fonds, Switzerland, assignor to Ebauches S.A., Switzerland

Filed Mar. 30, 1977, Ser. No. 782,627

Claims priority, application Switzerland, Apr. 2, 1976, 4123/76

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—334 **6 Claims**

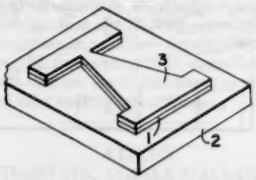


1. An electro-optic display device comprising, a substrate with an electrically conductive track, a display cell with an electrically conductive track spaced from the substrate track, an electrical control circuit connected to the substrate track, a lighting device positioned behind the display cell, the lighting device including a generally plate-shaped light guiding member with two opposite edges and formed of transparent insulating material, each said opposite edge having a respective thickened portion, one of said thickened portions forming an enclosure for a light source, each said thickened portion being coated with a respective conductive track, said thickened portions being interposed between said cell and said substrate, the conductive tracks of said thickened portions being in electrical contact with the respective conductive tracks of the cell and the substrate to render the same electrically connected.

4,118,112
METHOD FOR REDUCING POWER DISSIPATION IN TAPERED RESISTOR DEVICES

David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,124
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—351 1 Claim

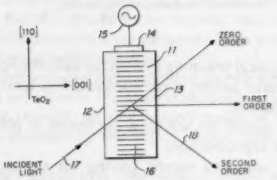


1. An indicating device comprising:
an electrically resistive element having a varying cross-sectional area along its length; and
a heat sensitive material operatively associated with said resistive element, said heat sensitive material having the property that at least one of its physical characteristics can be changed upon heating beyond a threshold temperature, and
said resistive element being of a material having a negative temperature coefficient of resistivity.

4,118,113
SECOND ORDER BIREFRINGENT ACOUSTO-OPTIC DEVICE

I-Cheng Chang, Sunnyvale, and David L. Hecht, Menlo Park, both of Calif., assignors to Itek Corporation, Lexington, Mass.

Filed Nov. 5, 1976, Ser. No. 739,230
Int. Cl.[2] G02F *1/33*
U.S. Cl. 350—358 5 Claims

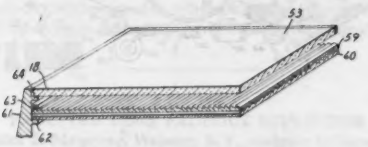


1. A second order acousto-optic device comprising a birefringent medium, means for generating and propagating acoustic waves in the said medium for providing nearly degenerate phase matching for first and second diffraction orders over a total scanning frequency bandwidth Δf, and an acoustic transit time τ, across the optical aperture of said medium, means for directing a laser beam through said medium to be diffracted by said acoustic waves, means for selecting the mid-band acoustic frequency of the said acoustic waves to achieve degenerate phase matching for deflecting the said beam into the second order with high efficiency, and means for utilization of said second order beam to provide doubled resolution, $2\Delta f/\tau$, while maintaining high diffraction efficiency.

4,118,114
LOW-GLARE OVERHEAD PROJECTOR

Raymond H. Anderson, Saint Mary's Point, and Gregory S. Lewer, New Scandia Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 499,138, Aug. 21, 1974, abandoned.
This application Jun. 21, 1976, Ser. No. 698,116
Int. Cl.[2] G03B *21/14*
U.S. Cl. 353—38 12 Claims



1. In an improved overhead projector comprising in alignment along an optical axis a source of illumination, a rectangular support for positioning a transparency to intercept the optical axis, an echelon lens structure located between the source and the support for focusing light from the source, and a projection lens for receiving focused light from the echelon lens structure and focusing a planar image of the transparency, the improvement wherein the echelon lens structure comprises a plurality of linear echelon lenses, each of which comprises a planar, optically transparent sheet having ridges and grooves in a first one of first and second major surfaces on opposite sides thereof; the ridges and grooves extending parallel to one another along a linear axis; the linear axes of the lenses being disposed at predetermined angles relative to one another and oriented with each linear axes positioned at an angle to a diagonal of said rectangular support such that uncontrolled light emanating from said echelon lens structure is confined to narrow bands substantially perpendicular to said linear axis and not radiated along said diagonal of said support so uncontrolled light will not emanate from a corner of said support; and at least the linear echelon lens nearest the light source having the first major surface thereof facing away from the source of illumination.

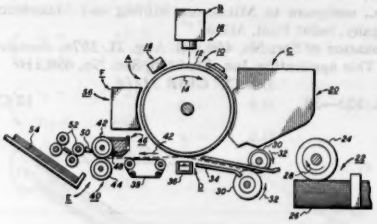
4,118,115
DEVELOPER ROLL DRIVE

Robert E. Hewitt, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 18, 1977, Ser. No. 778,906
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 DD 8 Claims

1. An apparatus for rendering visible a latent image arranged to be recorded on a surface with particles, including:
means for holding the particles;
means for securing releasably the particles to said holding means; and
means, having at least a portion thereof mounted internally

of said holding means, for moving said securing means to advance the particles into communication with the latent



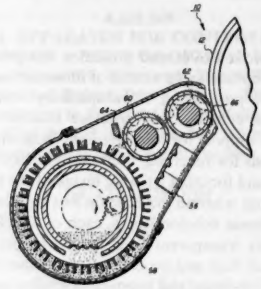


image recorded on the surface depositing at least a portion of the particles thereon.

4,118,116

X-RAY PROCESSING SYSTEM

Paul G. Koontz, Granada Hills; Richard L. Wright, and Robert J. Patterson, both of Canoga Park, all of Calif., assignors to Hipoint Research, Inc., Van Nuys, Calif.

Filed Jun. 20, 1977, Ser. No. 808,033

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 R **19 Claims**

1. A system for xeroradiographic processing of an irradiated plate carrying a latent image, comprising:

means receiving said plate for controlled displacement along a predetermined path, said means including first and second parallel conveyor belts having equi-spaced interlocking configurations for seizure of said plate;

means operative at a first position along said path to disperse charged toner particles into contact with said plate;

means supplying a print receiving medium;

means operative at a second position along said path to bring said medium into contact with said plate carrying said toner particles and to separate said medium bearing the image; and

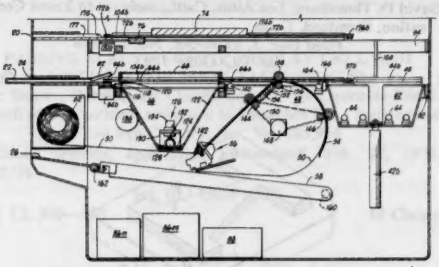
means operative at a third position along said path to uniformly heat said plate and maintain the plate at temperature stabilization until such time as the plate is re-used to form a latent image in response to irradiation, said means including third and fourth parallel conveyor belts having equi-spaced interlocking configurations for seizure of said plate.

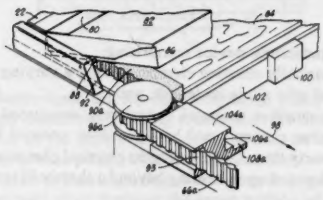
15. Apparatus for xeroradiographic exposure, comprising:

photoreceptor plate means of X-ray radiation responsive material for recording latent image indication, said plate means being of generally rectangular shape;

substrate means formed in juxtaposition to underlie said photoreceptor plate means in predetermined thickness to provide structural rigidity; and

first and second plate rail means each secured to an opposite side of said photoreceptor plate and substrate means, each of said plate rail means being formed along the outermost





surface with a plurality of equi-spaced, toothed formations.

4,118,117

ELECTROPHOTOGRAPHIC OPTICAL SCANNING SYSTEM

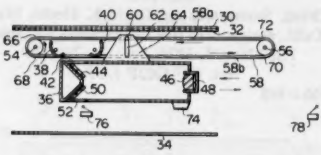
Yutaka Koizumi, and Kenji Hashimoto, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 12, 1976, Ser. No. 675,847

Claims priority, application Japan, Apr. 15, 1975, 50-45555

Int. Cl.[2] G03G *15/28*

U.S. Cl. 355—8 **4 Claims**



1. An optical scanning system for electrophotographic copying apparatus having a photoconductive member comprising, in combination:

a fixed platen on which a document is placed for electrostatic reproduction;

optical scanning means having an exposure aperture for optimum image formation, said aperture being a slit which has a fixed predetermined size, said scanning means comprising a light source integral with an imaging means through which a light image is incident on the photoconductive member;

drive means operative to reciprocatingly move the scanning means relative to the fixed platen and the stationary photoconductive member in one direction for one scanning and in the opposite direction for a subsequent scanning, said slit extending in a direction perpendicular to said directions, said drive means comprising a drive motor, a drive pulley connected to the motor, a idler pulley, and a belt trained around the drive and idler pulleys and connected to the scanning meas;

the scanning means comprising a member formed with a slot

extending perpendicular to the runs of the belt, the scanning means further comprising a pin fixed to the belt and slidably engaging in the slot; and

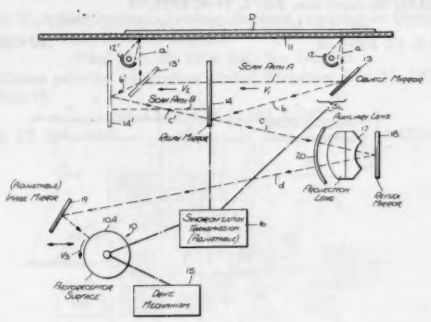
control means for adjustably varying the speed of the drive motor and adjustably varying the speed of the reciprocative movement of the scanning means to thereby adjust the intensity of the light image incident on the photoconductive member depending on the characteristics of the document for electrostatic reproduction, the control means comprising switch means to initially energize the motor and de-energize the motor when the scanning means reaches first and second predetermined positions after movement in said one direction and said opposite direction, the first and second predetermined positions being such that the pin is just about to move around the drive and idler pulleys respectively.

4,118,118

ELECTROSTATIC COPIER MACHINE WITH SELECTABLE MAGNIFICATION RATIOS

Robert M. Barto, Jr., Wyckoff, N.J., assignor to Universal Photocopy, Inc., Mountainside, N.J.

Filed May 7, 1976, Ser. No. 684,407
Int. Cl.[2] G03G *15/28;* G03B *27/52, 27/34*
U.S. Cl. 355—8 **9 Claims**



1. A xerographic copying machine capable of producing copies of an original document in a selectable mangification ratio without shifting the position of the projection lens, the machine comprising:

(A) a scanning assembly constituted by an object mirror and a light source adapted to travel at a uniform velocity with respect to the document to be copied, said document being laid face down on a transparent platen under which said scanning assembly travels;

(B) a relay mirror operatively coupled to the scanning assembly and movable in the same direction but at one-half the velocity thereof, an illuminated image of the document being directed by the object mirror onto the relay mirror;

(C) a stationary projection lens behind which is a reflex mirror at a fixed position, the relay mirror being oriented to direct the image through said lens onto the reflex mirror;

(D) a rotating drum having a photoreceptor surface, said drum rotating at a given peripheral speed;

(E) an image mirror associated with the drum and the reflex mirrpr, whereby the image on said reflex mirror is directed through said projection lens onto said image mirror and the image is cast thereby on the photoreceptor surface, and means to shift the position of said image mirror to a point providing a focal length appropriate to the selected magnification ratio, whereby the optical distance in the folded path extending between the document and the fixed reflex mirror remains constant regardless of changes in magnification ratio, and to impart an angle to said image mirror at said point to cause the image cast thereby onto said photoreceptor surface to be along a path normal to said surface, whereas the optical distance in the folded path between the fixed reflex mirror and the photoreceptor surface changes with changes in magnification ratio;

(G) retractable means to cover said projection lens with at least one auxiliary lens to change the focal length of the optics without displacing the projection lens; and

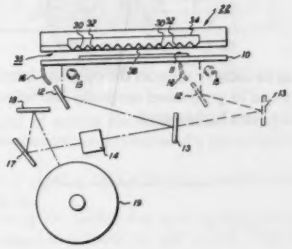
(H) an adjustable synchronizing transmission coupling said drum to said scanning assembly to change the scanning velocity of the assembly relative to the peripheral velocity of the drum in accordance with the selected magnification ratio.

4,118,119

FACETTED EDGE FADEOUT REFLECTOR

Dominick J. Maiorano, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1976, Ser. No. 719,794
Int. Cl.[2] G03G *15/00;* G03B *27/54*
U.S. Cl. 355—11 **7 Claims**



1. Exposure apparatus for directing a light pattern, reflected from a document retained in a stationary position by a transparent support, along a predetermined path terminating at the surface of a photoreceptor whereby the light pattern is effective to discharge a uniformly charged portion of the photoreceptor in accordance with the light pattern thereby leaving a latent electrostatic image thereon, said apparatus comprising:

a light source for illuminating said document, through said transparent support, and also illuminating portions of said support extending beyond said document; and

specular reflector means disposed adjacent the side of said document opposite said light source for reflecting the illumination from said light source extending beyond said document along said predetermined path whereby said photoreceptor is discharged in areas adjacent the area on said photoreceptor struck by said light pattern, said specular reflector means comprising pairs of planar reflecting surfaces each surface being disposed at a predetermined angle relative to said transparent support and one surface of one pair being parallel to each corresponding surface of the other pairs and the other surface of said one pair being parallel to each corresponding surface of said other pairs.

4,118,120

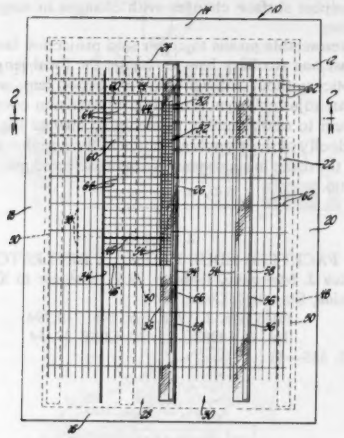
PAGE MODEL FOR PRINTING

Frederick G. Ruffner, 611 University Pl., Grosse Pointe, Mich. 48230, and Frank E. Bair, Livonia, Mich., assignors to Frederick G. Ruffner, Grosse Point, Mich.

Filed May 31, 1977, Ser. No. 802,208
Int. Cl.[2] G03B *27/62*
U.S. Cl. 355—75 **22 Claims**

1. A page model for use in printing comprising: a mounting sheet having front and back sides with at least one vertical column on the front side thereof; a plurality of rectangular cards having front sides for receiving printed matter thereon;

each card having opposite lateral edges; and first and second vertically extending card retainers spaced laterally from each other on the mounting sheet at opposite lateral sides of the



column so as to slidably support the opposite lateral card edges so each card can be positioned vertically just below the printed matter on the next higher card.

4,118,121

CONTINUOUS MICROFILM CAMERA

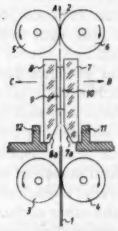
Traugott Liermann, Unterhaching; and Karl-Heinz Dietrich, Munich, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Jul. 21, 1977, Ser. No. 817,729

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1976, 2632791

Int. Cl.² G03B *27/62*

U.S. Cl. 355—75 **8 Claims**



1. A continuous microfilm camera comprising:

(a) a transport path for feeding original sheets through a microfilming area;

(b) two parallel opposite guide plates operatively mounted within the microfilming area and forming a transit slit therebetween, said slit being disposed in the transport path and having variable width, and at least one plate being transparent and at least one plate being movable with respect to the other plate; and magnetic attraction means attached to at least one of the plates for providing an attractive force decreasing in strength with increasing distance and directed toward the other guide plate.

4,118,122

METHOD OF RENDERING OBJECTS UNCOPYABLE BY PHOTOCOPY PROCESSES

James D. Rees, Pittsford, and Richard F. Lehman, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 7, 1977, Ser. No. 766,465

Int. Cl.² G03B *27/32*; B42D *15/00*

U.S. Cl. 355—77 **6 Claims**

1. A method of masking at least a portion of an object document to render information thereon uncopyable by a photocopying system having a spectral response in a first color, by providing for said information a background of a second color complementary to said first color by the superimposition of a color film thus to eliminate object contrast and to black out said information at the image receptor of said photocopying system.

4,118,123

EDITORS FOR MICROFICHE CAMERAS

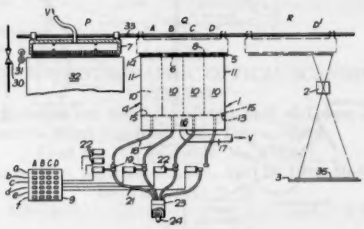
Harry Arthur Hele Spence-Bate, 1 Cheam Place, Morley, Australia (6062), and Michael Edwin Wilson, Perth, Australia, assignors to Harry Arthur Hele Spence-Bate, Morley, Australia

Filed Jun. 21, 1977, Ser. No. 808,543

Claims priority, application United Kingdom, Jun. 23, 1976, 26155/76; Australia, Jul. 2, 1976, 6518/76

Int. Cl.² G03B *27/00, 27/54, 27/62, 27/02*

U.S. Cl. 355—78 **10 Claims**



1. A microfiche editing device for copying images from one microfiche to another comprising a plurality of cells, each cell corresponding to a frame of a first microfiche to be held on the device and each having a rectilinear cross section substantially the same as each said frame, an array of illuminating means, one for each cell, means for holding the first microfiche on the device, means for holding and positioning a second, at least partly unexposed, microfiche in alignment with the first microfiche, light switching means associated with each of said illuminating means and a control means controlling each light switching means to project light through any one or more desired frames on the first microfiche onto an unexposed frame or frames on the second, microfiche, whereby images on several frames on the first microfiche can be simultaneously copied onto the second microfiche.

4,118,124

HOLOGRAPHIC SHEARING INTERFEROMETER

Kiyofumi Matsuda, Musashi-Murayama, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Nov. 23, 1976, Ser. No. 744,235

Claims priority, application Japan, Nov. 26, 1975, 50-141506

Int. Cl.² G01B *9/02*

U.S. Cl. 356—107 **8 Claims**

1. A method for the holographic shearing interferometry, which comprises producing a first hologram using an interference fringe formed between a first reference light beam and two light beams having slightly different angles of incidence, producing a second hologram using an interference fringe

formed between a second reference light beam and the light beams produced by an illuminating light beam projected on said first hologram from the direction of said first reference light beam, disposing the first hologram and the second hologram at a prescribed distance from each other, causing a light beam from an object to irradiate said first hologram from the

direction of said first reference light beam and projecting the light beams produced by said first hologram onto the second hologram for thereby causing the second hologram to reconstruct light beams in the direction of said second reference light beam, whereby the sheared interference fringe of the object is obtained in last reconstructed light beams.

4,118,125
POLARIMETERS

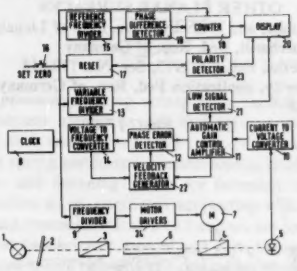
Rolf Karl Gundermann, London, England, assignor to Optical Activity Ltd., London, England

Filed Dec. 10, 1976, Ser. No. 749,475

Claims priority, application United Kingdom, Dec. 11, 1975, 50926/75

Int. Cl.[2] G01N *21/40, 4/04*

U.S. Cl. 356—116 **5 Claims**



1. In a polarimeter including:

a polariser having a fixed orientation; an analyser mounted for rotation about its axis; a motor for rotating said analyser; a clock for providing digital clock pulses at a predetermined frequency; means for driving said motor in synchronism with said digital clock pulses so that rotation of said analyser is synchronized with said clock pulses; a light detector responsive to the intensity of light transmitted through said polariser and said analyser and providing an output signal having a given frequency; and means for determining the phase of said light detector output signal with respect to the phase of a digital signal of said given frequency derived from said clock pulses, whereby the optical activity of a sample disposed between said polarimeter and said analyser is determined;

the improvement comprising:

said motor being a stepper motor, said driving means driving said stepper motor in synchronism with said digital clock pulses so that each step of said motor corresponds to a predetermined number of clock pulses; and said phase determining means comprising means for deriving a first digital signal of said given frequency from said clock pulses, means for maintaining said first digital signal in a fixed phase relationship with respect to said light detector output signal, means for deriving a second digital signal of said given frequency from said clock pulses, and means for comparing the phase of said first and second digital signals.

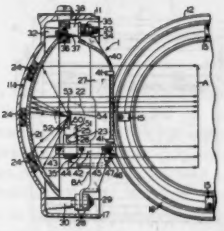
4,118,126
METHOD OF LOCATING A LIGHT AT THE FOCAL POINT OF A CONCAVE MIRROR OF A SIGNAL LAMP UNIT

Peter M. Noble, Valencia, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Feb. 22, 1977, Ser. No. 770,643

Int. Cl.[2] G01J *1/00*

U.S. Cl. 356—123 **10 Claims**



1. A method of setting the filament of a lamp at the focal point of a smooth concave reflector of a signal light comprising the steps of:

(a) placing a sighting device having a reticle into the socket of the lamp,

(b) positioning the socket and said sighting device until an image comes into focus on said reticle from the smooth surface reflector, and

(c) replacing said sighting device with a lamp.

4,118,127
METHOD OF DETECTING FAULTS IN MOVING WEBS OF MATERIALS

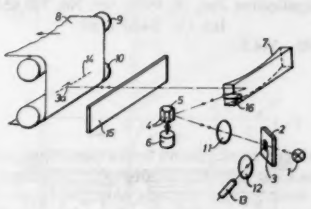
Hans-Joachim Klein, Wuppertal; Manfred Rupprecht; Heinz Wonneberg, both of Leverkusen; Julius Geiger, Odenthal-Gloebusch, and Günter Masa, Leverkusen, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 14, 1977, Ser. No. 777,334

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1976, 2611539

Int. Cl.[2] G01N *21/32*

U.S. Cl. 356—200 **14 Claims**



1. A method for the detection, identification and localisation of longitudinally orientated faults in a moving web in which the web is optically scanned line by line transversely to its direction of movement by a stationary scanning device and read off in reflection, the length of scanning line of the scanning device being greater than or equal to the width of the said web, wherein at least one time mark is formed electronically within the scanning line, which mark, starting from one end of

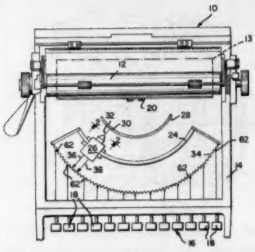
the scanning range, is shifted forwards equal steps with each scanning movement until the other end of the scanning range is reached, and the instantaneous value of reflected scanning signal appearing at the time mark is summed, over a scanning cycle consisting of a plurality of scanning movements and a fault is indicated only when there is a deviation from a predetermined value.

4,118,128

OPTICAL TYPEWRITER

Louis Van Den Essen, 131 E. Riviera Dr., Lindenhurst, N.Y. 11757

Filed Sep. 8, 1975, Ser. No. 611,494
Int. Cl.[2] B41J *3/20*
U.S. Cl. 400—118 **1 Claim**



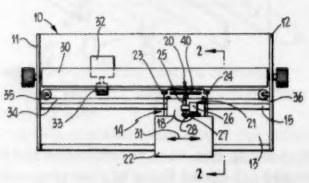
1. A writing machine comprising a translatable paper carriage for holding a light sensitive paper; a fixedly positioned sight alongside said carriage for defining a portion of said paper to be written on; an elongated track directed along a first arc swung about said sight; an elongated template lying along a second arc located between said sight and said track, said second arc also being swung about said sight; said template having a plurality of perforate indicia thereon; said indicia being spaced apart along the length of said template; a directional light source mounted for movement along said track; said light source being aimed toward said sight for directing light through a selected one of said indicia and onto said paper; there being a correspondence between the selected indicia and the position of said light source along said track; a keyboard for selecting which of said indicia is to be written on said paper; and motor means responsive to said keyboard for positioning said light source along said track.

4,118,129

ROTARY WHEEL PRINTING SYSTEM

Willy J. Grundherr, Sunnyvalle, Calif., assignor to Qume Corporation, Hayward, Calif.

Continuation of Ser. No. 485,055, Jul. 1, 1974, abandoned. This application Jun. 28, 1976, Ser. No. 700,654
Int. Cl.[2] B41J *1/30*
U.S. Cl. 400—144.2 **14 Claims**



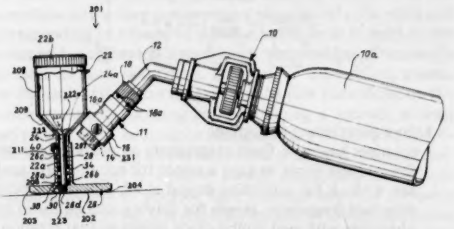
1. For use in a rotary wheel printing system having a translatable carriage; means for translating said carriage along a print line, a rotary print wheel mounted on said carriage, said rotary print wheel having a plurality of individual print characters distributed about the radial center thereof; means for rotating said print wheel; means for impressing said print characters against a print member; first position indicating means for generating signals representative of the instantaneous position of said print wheel, said first position indicating means including an encoder disc mounted for rotation with said print wheel and having a plurality of alternately arranged opaque and translucent portions arranged in a substantially circular timing track about the radial center of said disc; and means responsive to said print wheel position signals for actuating said imprinting means; the improvement wherein said first position indicating means includes a first light source mounted adjacent a first surface of said disc, a plurality of light sensitive devices mounted adjacent the opposite surface of said disc and responsive to the angular displacement of said opaque and translucent timing track portions when said print wheel is rotated for generating a pair of position trains having a substantially constant phase difference, and first feedback means for maintaining the intensity of said light source substantially constant, said first feedback means including power means for applying electrical power to said light source; first light sensitive means disposed adjacent said opposite side of said disc at a position to continuously intercept light radiation emitted by said first light source for generating an electrical signal representative of the intensity of said light radiation adjacent said light sensitive devices; comparison means for comparing said intensity signal with a standard signal representative of a preestablished desired light intensity; means for generating a correction signal when said intensity signal differs from said standard signal; and means for coupling said correction signal to said power means to vary the magnitude of said light intensity to re-establish said desired light intensity.

4,118,130

UNITARY ARRANGEMENT FOR COATING SKIS AND OTHER PLANAR SURFACES

Dietmar Kasubke, and Wilhelm Trefz, both of Liepziger Str. 9, D-7157 Murrhardt, Fed. Rep. of Germany

Filed Feb. 22, 1977, Ser. No. 770,813
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1976, 2607063
Int. Cl.[2] B05C *17/00*
U.S. Cl. 401—2 **10 Claims**



1. A portable arrangement for coating skis with a heat-plasticizable substance, the arrangement comprising, in combination,

application means including a container made out of heat-conductive material for storing the heat-plasticizable material, and a plasticizing member having an application plate with a substantially planar surface disposed underneath said plate, a conduit extending upwardly from said planar surface and said plate to said container, said planar surface having a first aperture in communication with said conduit and said plate, said conduit being made of heat-conducting material and being adapted to conduct heat-plasticizable material from said container to said first aperture; normally closed valve means operatively mounted in said conduit; and heating means operatively mounted on said container and having an outlet nozzle

substantially directed toward said conduit and said plate for directing a flame to selectively plasticize said plasticizable material said plate extending laterally from said aperture and said planar surface of said plate being adapted to be passed over the underside of a ski, the improvement comprising,

that said plate and conduit forms a manual applicating and coating means which is adapted to be heated by said heating means to a temperature which is higher than the temperature to which said container is heated.

4,118,131

PNEUMATIC SPRING

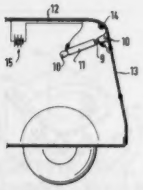
Klaus Schnitzius, Rheinbrohl, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Apr. 1, 1976, Ser. No. 672,654

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1975, 7511515[U]

Int. Cl.² F16C *11/06*

U.S. Cl. 403—24 **12 Claims**



8. In a pneumatic spring arrangement including a spring cylinder element having an axis and formed with a cavity therein; a piston assembly movably received in said cavity and including a spring piston rod element axially projecting from said cavity; and fastening means for fastening each of said spring elements to an associated supporting element, one of said fastening means including a ball-and-socket joint having a ball part and a socket part, one of said parts being attached to the associated spring element, the other part being adapted to be fastened to the associated supporting element, the improvement in said ball-and-socket joint which comprises:

(a) said socket part including a mounting portion and a body portion;

(b) said body portion being formed with a cavity and including barb means permitting insertion of said ball part into said cavity by applied pressure of predetermined magnitude,

(c) said barb means including a lug portion of said body portion flexibly movable inward and outward of said cavity;

(d) said ball part having a spherically arcuate head portion releasably received in said cavity and a neck portion of reduced diameter partly received in said cavity and projecting from said head portion outward of said cavity,

(e) said socket part being formed with a recess contiguously adjacent to said lug portion and partly separating said mounting portion from said body portion;

(f) a backing member releasably received in said recess and holding said lug portion engaged with said neck portion; and

(g) attaching means on said mounting portion for attaching the amounting portion to one of said elements.

4,118,132

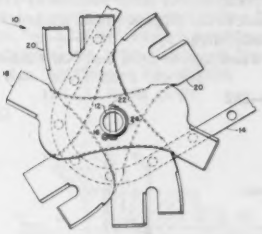
ROTARY TILLER TINE ASSEMBLY WIRE CLIP

Dale Rudolph Dobberpuhl, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Feb. 21, 1978, Ser. No. 881,406

Int. Cl.² F16B *19/00*

U.S. Cl. 403—24 **2 Claims**



1. In a rotary tiller rotor including a shaft, a tine structure including a cylindrical hub received on the shaft, the hub having a hole extending transversely therethrough and aligned with a hole provided in the shaft, a cylindrical pin received in the aligned holes of the hub and shaft and a spring wire clip, operative for holding the pin in place, being received in a transverse hole in said pin adjacent an end thereof, the improvement comprising: said spring wire clip including an intermediate section disposed parallel to said shaft and received in the transverse hole in the pin; said intermediate section having a first end joined to an end section of the clip which extends perpendicular to the intermediate section and a second end joined to an arcuate section, which embraces the hub throughout an arc of at least 180°.

4,118,133

DEVICE FOR LOCKING ELECTRICAL UNITS

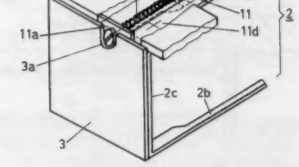
Theo Küpfer, Lupfig, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Mar. 21, 1977, Ser. No. 779,789

Claims priority, application Switzerland, Apr. 28, 1976, 5315/76

Int. Cl.² F16B *3/06*

U.S. Cl. 403—24 **11 Claims**



1. A locking device arranged on an electrical unit slidably received in a predetermined direction of insertion in a receptacle of a rack incorporating at least one rack member, to retain the electrical unit in the rack, said locking device comprising:

two stop members spaced apart in the direction of insertion of the electrical unit;

said two stop members defining front and rear spaced stop members straddling the rack member when locking the electrical unit in the receptacle of the rack;

manually actuatable drive means cooperating with said two stop members for displacing said two stop members relative to one another;

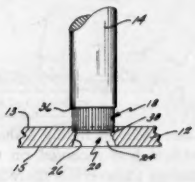
an adjusting member for adjusting said rear stop member between an insertion position within the free cross-section of the rack receptacle and a locking position in which a portion thereof extends beyond the free cross-section of the receptacle to engage the rack member of the rack.

4,118,134

FASTENER JOINT AND METHOD THEREOF

Orin C. Mansel, Grand Rapids, Mich., assignor to Lescoa, Inc., Grand Rapids, Mich.

Filed Apr. 8, 1974, Ser. No. 458,990
Int. Cl.[2] F16B *11/00*
U.S. Cl. 403—282 **8 Claims**



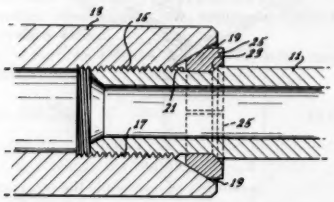
1. In a vehicular windshield wiper crank assembly including a crank means joined to one end of a pivot shaft, said crank means and said pivot shaft being formed of material of similar hardness, the improvement comprising: said crank means having an opening formed therethrough with a reduced diameter portion and an enlarged diameter portion, said one end of said pivot shaft having a knurled portion, the root diameter of said knurl corresponding generally to said reduced diameter portion of said opening formed through said crank means, said knurled portion being driven into said opening initially through said reduced diameter portion causing deformation of at least one of said knurled portion or the material surrounding said reduced diameter portion to cause material to flow into said enlarged diameter portion to form a positive joint.

4,118,135

PRE-STRESSED ROD JOINT

Roy F. Cooper, Downey, Calif., assignor to Sargent Industries, Huntington Park, Calif.

Continuation of Ser. No. 649,978, Jan. 19, 1976. This application May 2, 1977, Ser. No. 793,090
Int. Cl.[2] B25G *3/02*
U.S. Cl. 403—361 **16 Claims**



1. In combination in a rod joint pre-stressed to eliminate fatigue due to cyclic stress imposed upon the rod joint,

a first rod member having

an external surface and

a threaded bore and

a seating surface disposed at one end of said bore and extending outwardly from the threaded bore,

a second rod member having

a threaded external surface disposed in cooperative relationship with the threads in first rod member and having a second surface displaced from the threaded external surface and having external dimensions corresponding to those of the threaded external surface and having a seating surface disposed at one end of the second rod member between the threaded external surface and the second surface and in displaced relationship to the seating surface on the first rod member, the seating surface on the second rod member being depressd relative to the threads on the threaded external surface and relative to the second surface and being disposed between the threaded external surface and the second surface and extending to a level no greater than the threaded external surface, and

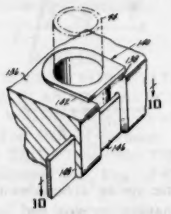
ring means seated between the seating surfaces on the first and second rod members and disposed relative to the seating surfaces to exert against the seating surfaces oppositely directed forces which pre-stress the threads of the first and second rod members with a force which is greater than the maximum cyclic stress imposed upon said rod members.

4,118,136

APPARATUS FOR ATTACHING TUBING TO A ROTATING DISK

Robert J. Corsmeier, and Richard N. Brown, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 3, 1977, Ser. No. 803,163
Int. Cl.[2] F01D *5/18*
U.S. Cl. 403—386 **9 Claims**



9. An attachment between a rotating member and a tube comprising:

a ring extending from said member and about the rotational axis thereof, said ring having a contoured slot extending from one edge thereof toward said member and a groove intersecting said contoured slot;

a wear collar placed about the tube, the collar characterized as being generally shaped to the contour of, and received by, said groove and having a pair of laterally extending lips receiving said ring therebetween; and

a locking ring inserted within said groove.

4,118,137

PAVEMENT AND PROCESS OF PROVIDING THE SAME

Bobby D. LaGrone, and Bobby J. Huff, both of Vicksburg, Miss., assignors to U.S. Rubber Reclaiming Co., Inc., Vicksburg, Miss.

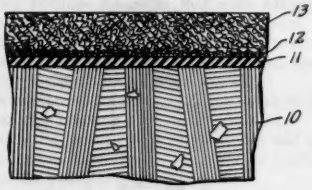
Filed Dec. 6, 1976, Ser. No. 747,528
Int. Cl.[2] E01C *7/36*
U.S. Cl. 404—76 **8 Claims**

1. A process of surfacing a dirt roadway which comprises the steps of:

loosening the soil of the roadway and mixing it with portland cement and water and then compacting and setting the portland-cement-soil mixture to provide a portland-cement-stabilized soil roadbase,

mixing 3–30wt% of particulate rubber with molten asphalt at a temperature of 200° to 450° F and spreading the resulting reaction product in fluent form over said port-

land-cement-stabilized solid roadbase at a rate of 0.3–1.0 gal. per square yard to form in situ an elastic membrane-like layer overlying said roadbase, and having an elongation in excess of 100% at 40° F without breaking and a recovery in excess of 75% after elongation to 150% of its original length under tensile stress at 77° F,



spreading crushed mineral aggregate over said rubber-asphalt layer and rolling to form a protective layer, and

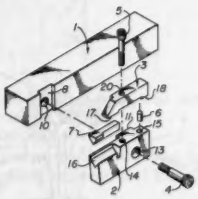
applying over said protective layer an outer course of asphalt concrete having a thickness of at least 2 inches.

4,118,138

CUTTING TOOL

Victor C. Takacs, and Joseph E. Takacs, both of Houston, Tex., assignors to Triangle Grinding, Inc., Houston, Tex.

Filed Jun. 13, 1977, Ser. No. 806,146
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—112 **18 Claims**



1. A cutting tool comprising:

an elongated bar member;

an anvil member removably fastened to one end of said bar member and having an elongated recess in which a cutting insert may be received; and

a clamp member removably fastened to said anvil member for rigidly clamping said cutting insert in said elongated recess;

said bar member being provided with a bottom threaded hole having a smooth counterbore of larger diameter, said anvil member being provided with a smooth bore hole of substantially the same diameter of said counterbore;

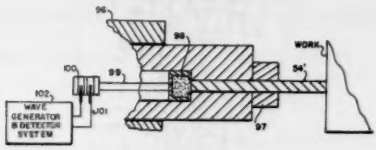
said anvil member being at least partially fastened to said bar member by a screw member having a threaded end for engagement with the threaded portion of said threaded hole and a smooth cylindrical portion for disposition within said smooth counterbore and said anvil member smooth bore hole.

4,118,139

MACHINE TOOL AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 479,515, Jun. 14, 1974, Pat. No. 3,963,364, which is a continuation-in-part of Ser. No. 182,501, Sep. 21, 1971, Pat. No. 3,817,647, which is a continuation-in-part of Ser. No. 775,433, Nov. 13, 1968, Pat. No. 3,605,909, which is a continuation-in-part of Ser. No. 518,616, Jan. 4, 1966, Pat. No. 3,476,481, which is a continuation-in-part of Ser. No. 294,076, Jul. 10, 1963, Pat. No. 3,226,833, which is a continuation-in-part of Ser. No. 477,467, Dec. 24, 1954, abandoned. This application Jun. 7, 1976, Ser. No. 693,416
Int. Cl.[2] B23B *39/04*
U.S. Cl. 408—12 **8 Claims**



1. A machine tool comprising:

a tool support,

a tool head supported by said tool support,

rotary cutting tool means supported for rotation on said tool head,

power operated means for rotating said cutting tool means to permit said tool means to perform a cutting operation on work,

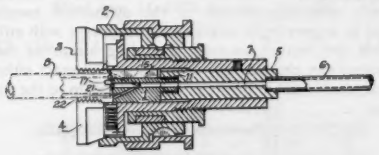
electromagnetic radiation generating means supported by said tool and operable to generate and direct radiation against work operated on by said cutting tool means as said cutting tool means operates to cooperate therewith in improving the cutting action of said cutting tool means.

4,118,140

COMBINATION DIE HEAD AND CHAMFERING TOOL

Eddie J. Hamilton, c/o A. M. S. Inc., 1246 Vernon Way, El Cajon, Calif. 92020

Filed Jul. 11, 1977, Ser. No. 814,526
Int. Cl.[2] B23B *27/10, 51/00;* B23G *1/26*
U.S. Cl. 408—59 **4 Claims**



1. In combination with a rotary collapsing die head wherein threading chasers can be withdrawn from their operating position to a non-threading position while the head continue its rotary motion , a device for chamfering the end of the part being worked upon which comprises:

a cylindrical block coaxially inserted in the hub of the die head;

a cutting edge associated with the outer face of the cylindrical block;

means for fastening the cylindrical block into the hub of the die head;

a rotating tubular shank connected to a source of pressurized fluid driving the die head; at least one channel within the cylindrical block between the drive shank and said outer face; and on said outer face, a helicoidal section ahead of the cutting edge and raising toward said cutting edge.

4,118,141

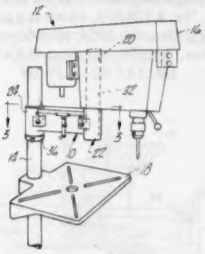
ATTACHMENT FOR A ROTARY DRIVE MACHINE

Daniel M. Spohn, Jr., 8451 Miller Rd., Swartz Creek, Mich. 48473

Continuation-in-part of Ser. No. 671,597, Mar. 29, 1976, abandoned. This application Nov. 24, 1976, Ser. No. 744,628

Int. Cl.[2] B23B *47/00, 39/12*

U.S. Cl. 408—90 **4 Claims**



1. An attachment for a rotary drive machine of the type having a cylindrical support columm, a work support member and first means for rotatably mounting said work support member to said support column at a point spaced downwardly from the upper end thereof, and a power tool means and a second means for rotatably mounting said power tool means to the upper end of the support column whereby said support column supports said power tool means above the work support member, said attachment comprising a horizontally elongated arm member, a first tubular portion secured at one longitudinal end of said arm member and a second tubular member being secured to the other longitudinal end of said arm member, each tubular member including an internal bore formed therein of the same diameter as the diameter of said support column, the axes of said internal bores being spaced and parallel to each other and substantially perpendicular to the longitudinal axis of said arm member, wherein said internal bore in said first tubular member is a throughbore adapted to be slidably received over said support column, and means for axially adjustably locking said first tubular member to said support column, a cylindrical member of substantially the same diameter as said support column and means for rotatably mounting said cylindrical member in the internal bore of the second tubular member so that said cylindrical member extends vertically upwardly from said second tubular member whereby the upwardly extending portion of the cylindrical member is adapted to supportingly engage and cooperate with either of said first and second rotatable mounting means so that the attachment can alternatively supportingly connect either the work support member or the power tool means to the support column.

4,118,142

DUAL-PUMP COUPLING

William A. Hahs, Hwy. 61, South, Sikeston, Mo. 63801

Filed Aug. 15, 1977, Ser. No. 824,824

Int. Cl.[2] F04D *25/16;* **F01D** *13/00*

U.S. Cl. 415—69 **8 Claims**

1. An adjustable drive coupling between a deep well propeller pump and a booster pump assembly, comprising

(a) a housing adapted to be carried on the exposed end of a well casing,

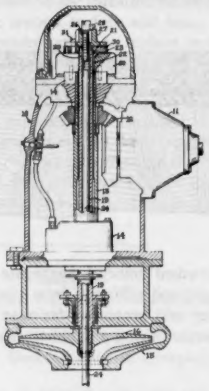
(b) a booster pump within said housing providing a hollow driven shaft having an impeller thereon within a volute casing having open communication with the well casing,

(c) a driving power source assembly within said housing,

(d) means connecting said driving power source to said hollow driven shaft for operating said booster pump,

(e) means for vertically adjusting said hollow drive shaft and said impeller of said booster pump within said housing and said volute casing relative to said driving power source assembly,

(f) a propeller pump shaft extending coaxially of said hollow drive shaft of said booster pump and projecting from said housing into the well casing,



(g) means connecting said propeller pump shaft to said hollow driven shaft of said booster pump, whereby said propeller pump is simultaneously operated therewith by said driving power source assembly, and

(h) means for independently vertically adjusting said propeller pump shaft coaxially of said hollow drive shaft of said booster pump.

4,118,143

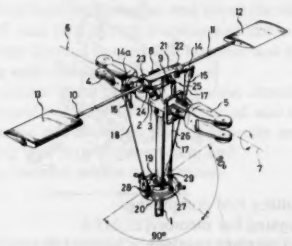
STABILIZING AND CONTROL DEVICE FOR TWO-BLADED HELICOPTER ROTORS

Franz Kavan, Lindenaststrasse 56, D-8500 Nuremberg, Germany

Filed Mar. 29, 1977, Ser. No. 782,337

Int. Cl.[2] B64C *27/36, 27/74*

U.S. Cl. 416—18 **5 Claims**



1. A stabilizing and control device in combination with a two-bladed helicopter rotor connected to and driven by a rotor shaft comprising;

a swashplate assembly connected around said rotor shaft;

a tiltable bar;

said rotor blades having an axis intersecting the axis of said rotor shaft at right angles;

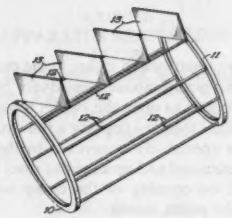
means pivotally connecting said tiltable bar to said rotor shaft on a pivot axis that intersects the axis of said rotor shaft and is disposed parallel to the axis of said rotor blades;

a pair of winglets connected on the opposite ends of said tiltable bar;

said tiltable bar connected for rotation about its longitudinal

axis relative to said means and at right angles to the axis of said rotor blades;
a pair of mixing lever bars connected to said means and extending outwardly in opposite directions on opposite sides of the axis of said rotor shaft and parallel to said tiltable bar;
first control linkage means connected between said pair of mixing lever bars and said swashplate assembly;
connecting portions mounting said rotor blades for pitch adjustment about the axis of said rotor blades;
second control linkage means connected between said pair of mixing lever bars and said connecting portions for adjusting the pitch of said rotor blades;
an arm connected to rotate said tiltable bar about its longitudinal axis, and having a connecting portion;
and control rod means connected between said connecting portion and said swashplate assembly for cyclical adjustment of the pitch of said winglets.

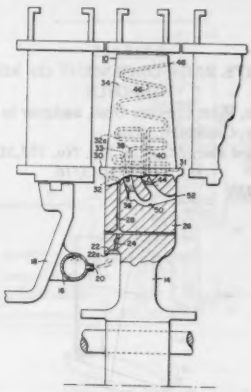
4,118,144
SUPPORT MEANS FOR A WINDMILL
Lawrence L. Kelley, 526 Lincoln Ave., Titusville, Fla. 32780
Filed Apr. 16, 1976, Ser. No. 677,812
Int. Cl.[2] F01D *1/00;* **F03D** *1/04, 7/04, 11/04*
U.S. Cl. 416—41 **22 Claims**



1. Apparatus for deriving a rotational motion from air currents which comprises:
first annular means;
second annular means spaced from said first annular means;
strut means extending between said first and second annular means;
blade assembly means supported by said strut means and comprising cross-beam means extending between adjacent ones of said strut means and impeller means secured to said cross-beam means;
first support means including means engaging said first annular means while allowing rotation thereof; and
second support means independent of said first support means and including means engaging said second annular means while allowing rotation thereof.

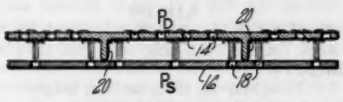
4,118,145
WATER-COOLED TURBINE BLADE
William F. Stahl, Media, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 2, 1977, Ser. No. 773,461
Int. Cl.[2] F01D *5/18*
U.S. Cl. 416—96 R **5 Claims**

1. An improved fluid cooled gas turbine blade having a coolant delivery passage through the blade root in flow communication with coolant flow channels traversing the airfoil portion of the blade subjacent the surface thereof wherein the improvement comprises:
a plurality of enlarged chambers in the blade serially connected by coolant flow channels with each such chamber having at least one coolant channel discharging coolant thereinto and at least another coolant channel removing coolant therefrom, said chamber providing a coolant reservoir for separation of the coolant according to its density to permit vaporization therein of at least a portion of the coolant;



vapor exhaust path means extending from each chamber to a downstream facing blade surface for discharging the vapor generated in each chamber whereby said another coolant channel receives liquid coolant from said chamber substantially free of vapor to optimize heat transfer from the blade to the coolant therein; and,
final coolant passage connecting the last of said chambers in said series to an exhaust port generally adjacent the blade tip.

4,118,146
COOLABLE WALL
James Albert Dierberger, Hebron, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Aug. 11, 1976, Ser. No. 713,739
Int. Cl.[2] F01D *5/18*
U.S. Cl. 416—97 A **2 Claims**



1. In a coolable wall element of the type formed of:
a first plate member having a plurality of transpiration holes extending therethrough;
a second plate member spaced from said first plate member and having a plurality of impingement orifices extending therethrough; and
a plurality of ribs extending between said first and second plates to form a plurality of chambers therebetween wherein cooling air is flowable to each chamber through a plurality of said impingement orifices having a total area (A_I) and from each chamber through a plurality of said transpiration holes having a total area (A_T); and of the type wherein said wall element is adapted for combined impingement and transpiration cooling at a pressure ratio

$(P_S)/(P_D)$ across the wall element which differs substantially with physical position along the wall element, P_S being the supply pressure of cooling air to each chamber and P_D being the pressure to which cooling air is discharged from each chamber, the improvement comprising:

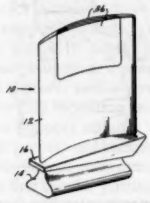
transpiration holes and impingement orifices sized such that the ratio (A_T/A_I) of the total area of the transpiration holes from each of said chambers to the total area of the impingement orifices to each of said chambers is related to the ratio (P_S/P_D) of the supply pressure to the discharge pressure across that chamber by the curve shown in FIG. 4.

4,118,147

COMPOSITE REINFORCEMENT OF METALLIC AIRFOILS

Delmar H. Ellis, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 22, 1976, Ser. No. 753,317
Int. Cl.[2] F01D *5/16*
U.S. Cl. 416—230 **13 Claims**



1. A method of fabricating a turbomachinery blade which avoids objectionable stripe mode resonance comprising the steps of:

fabricating a turbomachinery blade out of a metallic parent material, the blade having an airfoil portion and a root portion;

running the blade in the turbomachine;

measuring the stress levels within the blade over the operational range of turbomachinery rotational speeds;

selecting a speed which produces an objectionable stripe mode stress level;

determining the nodal pattern for the selected speed; and

substituting a filament composite material for the parent material at the airfoil tip wherein the chordwise extent of the composite material includes the nodal points for the selected speed and the composite filament orientation is substantially chordwise.

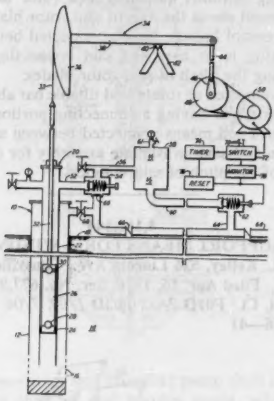
4,118,148

DOWNHOLE WELL PUMP CONTROL SYSTEM

Loy F. Allen, Odessa, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed May 11, 1976, Ser. No. 685,295
Int. Cl.[2] F04B *49/00*
U.S. Cl. 417—12 **11 Claims**

1. A control system for a well having a wellhead at the ground surface, a downhole reciprocating well pump landed in the well, a pumping unit operatively connected to the well pump and driven by a prime mover, tubing extending from the well pump upwardly through the well to the wellhead, and a delivery line from the well communicating with the upper end of the tubing, comprising a back pressure valve adapted to open at a predetermined pressure having an inlet communicating with the delivery line and an outlet, a displacement cell closed at its upper end to flow outward therefrom and having an outlet at the lower end thereof and an inlet, said displacement cell having a volume larger than the displacement volume of the pump, a transfer line connecting the outlet of the back pressure valve with the inlet of the displacement cell, a discharge line extending from the outlet of the displacement cell, a dump valve in the discharge line, said dump valve being constructed and arranged to open at a first preselected pressure not exceeding the predetermined pressure and close at a second preselected pressure lower than the first preselected pressure and to drain the displacement cell in a period less than the full cycle of the pump, an energizing circuit for the prime



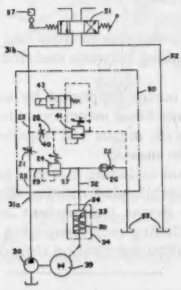
mover, normally closed switch means in the energizing circuit, a timer in the energizing circuit operatively connected to the switch means adapted to open the switch means after a preselected period longer than the time for a full cycle of the pump, and reset means operatively connected to the timer and the dump valve constructed and arranged to reset the timer to the starting position on opening of the dump valve to prevent shutting down the prime mover.

4,118,149

OUTPUT REGULATION IN HYDRAULIC AND HYDROPNEUMATIC SYSTEMS

Lars Hagberg, Borlänge, Sweden, assignor to Hytec AB, Borlange, Sweden

Filed Jan. 31, 1977, Ser. No. 764,472
Claims priority, application Sweden, Feb. 5, 1976, 7601234
Int. Cl.[2] F09B *49/08;* **F16D** *31/02*
U.S. Cl. 417—26 **15 Claims**



1. Apparatus for regulating the output of a system fed with a fluid medium irrespective of the instantaneous pressure in the system, said system having a primary line (**31** *a* and *b*), the apparatus comprising a regulating device (**20**) connected to said primary line and including a throttling (**21**), which can be adjusted, an inlet connection (**22**) to said throttling and an outlet connection (**23**) connected to said throttling, which connections are connected to said primary line (**31** *a* and *b*), a

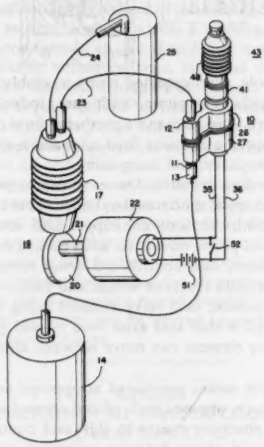
pre-set non-return valve (24), a spring-loaded non-return valve (25) fitted with a leakage connection (26), and further connections (27, 28, 29) for flow of medium between the connections and valves, a control line (32) connected with the connection (27) between the pre-set non-return valve (24) and the spring-loaded non-return valve (25), said pre-set non-return valve (24) sensing pressure drop at the throttling (21), and when this pressure drop reaches a certain value the non-return valve opens so that medium is transferred via the connection (29) to the connection (27), so that the pressure in the connection (27) and connected control line (32) increases, control device (34) for regulation of the quantity of flow to the primary line (31 *a* and *b*), said control device (34) comprising a spring-loaded piston (33) activated by increased pressure in control line (32) such that on the basis of the output pressure in the control line, the flow of medium to the primary line (31 *a* and *b*) is lower than said output pressure, when the pressure in the control line exceeds said output pressure, and is higher when the pressure in said control line is below said output pressure, whereby the pressure in the connection (27) and consequently the control line (32) will decrease continuously when the pre-set non-return valve (24) is closed, because the medium is pressed from the connection (27) through the leakage connection (26) in the spring-loaded non-return valve (25).

4,118,150

CONTROL APPARATUS RESPONSIVE TO LIQUID FLOW

Henry F. Hope, 2421 Wyandotte Rd., and Stephen F. Hope, both of Willow Grove, Pa. 19090

Filed Aug. 31, 1977, Ser. No. 829,288
Int. Cl.[2] F04B *49/02*
U.S. Cl. 417—40 **11 Claims**



1. Control apparatus responsive to liquid flow comprising

a liquid receptacle,

a pump connected to said receptacle for withdrawal of liquid therefrom for delivery, and

means interposed between said receptacle and said pump and having a portion movably responsive to liquid flow therethrough,

said means including electric contact members controlled by said movable portion, and

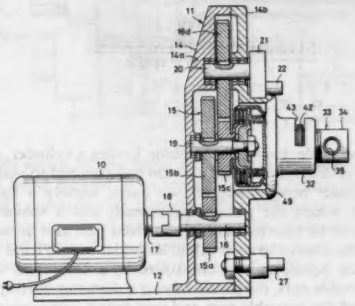
an expansible chamber member for positioning said movable portion under predetermined pressure conditions in said interposed means, and said pump is motor driven and said contct members control the operation of the motor driven pump.

4,118,151

PUMP DEVICE

Takao Murakami, Chigasaki; Yasuo Ishikawa, Yokohama, and Masahiro Ito, Tokyo, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Continuation-in-part of Ser. No. 562,334, Mar. 26, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 735,210
Claims priority, application Japan, Apr. 3, 1974, 49-36919
Int. Cl.[2] F16D *25/11, 25/00;* F04B *49/00*
U.S. Cl. 417—223 **1 Claim**



1. In a pump device having liquid pressure detecting means,

a pump for pumping a liquid from a liquid supply source through a liquid transfer path;

a power source for operating continuously;

power transmission means for transmitting driving power through a power transmission path to said pump for driving the pump;

cluch means in said power transmission path for coaction with said liquid pressure detecting means; said device comprising, in combination,

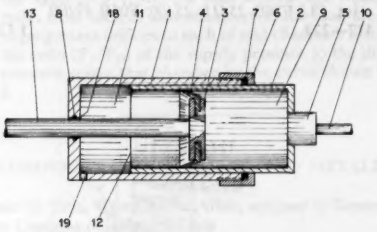
means for detecting the pressure of the liquid delivered by the pump, said means being defined by a liquid pressure detecting chamber provided in and constituting a part of said liquid transfer path, the liquid being transferred through said liquid transfer path thereby being introduced into and through said chamber, a displacement member subject to the pressure of the liquid within said liquid pressure, means for urging said displacement member in a direction opposite to that in which said member moves when subjected to said liquid pressure, and means for adjusting the distance between said displacement member and said control means for adjusting the setting of said predetermined displacement value; said clutch means being a first rotating structure responsive to rotational power transmitted thereto from said power source, a second rotating structure responsive to rotational power transmitted thereto from said first rotating structure and transmitting said rotation to said pump, clutch means interposed between said first and second rotating structures being operational upon being pressed therebetween with a clamping force to transmit rotational power in conformance with said clamping force, and control means spaced apart from said displacement member operable in response to displacement by said displacement member of a magnitude greater than a predetermined displacement value for controlling said clamping force of said first and second rotating structures as applied against said clutch structures.

4,118,152

PUMP FOR VARIABLE DOSING

Dan Bron, 36 Palmach St., Haifa 34 558, Israel

Filed May 23, 1977, Ser. No. 799,833
Claims priority, application Israel, Jun. 2, 1976, 49703
Int. Cl.[2] F04B *21/02, 21/08*
U.S. Cl. 417—254 **4 Claims**



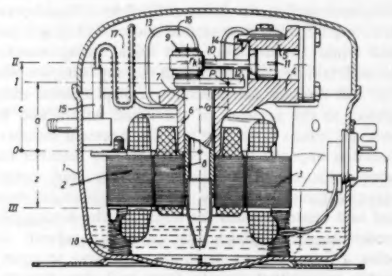
1. A variable dosing piston pump having a cylinder, a piston housed in said cylinder and a piston rod attached to said piston, the cylinder being made of two parts, namely a fixed part through which the piston rod extends and a movable part adapted to be inserted within said fixed part and means to fix said parts relative to each other, an outlet in said fixed part for the dosed liquid, an inlet controlled by a non-return valve in said movable part, the piston having a diameter corresponding to that of the movable part and said piston comprising a non-return valve.

4,118,153

ENCAPSULATED MOTOR COMPRESSOR FOR REFRIGERATORS

Jørgen Christian Stannow, Sonderborg; Kjeld Kjeldsen, Nordborg; Hans Jürgen Tankred, Sonderborg, and Per Johan Madsen, Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Apr. 11, 1977, Ser. No. 786,424
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1976, 2617369
Int. Cl.[2] F16F *15/06;* F04B *39/00*
U.S. Cl. 417—363 **4 Claims**



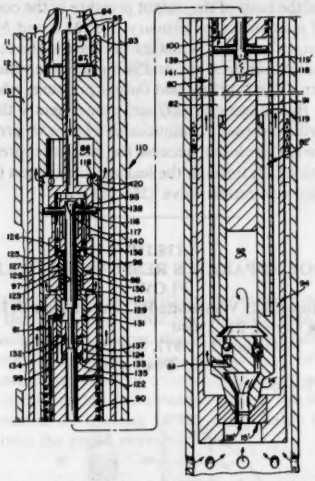
1. An encapsulated motor compressor for refrigerators, comprising, an integrated motor and compressor unit with a lower motor part and an upper compressor part, said upper compressor part including a piston and a connecting rod, said unit having a center of gravity in a reference plane, said unit including a vertical motor crank shaft with a crank pin in a first plane at the upper end thereof, said crank pin being connected to said connecting rod, said crank pin and said connecting rod and piston having a mass M with a center of gravity spaced r_k from the axis of said shaft, at least one compensating weight on said shaft in a second plane on the same side of said reference plane as said compressor part, said compensating weight having a mass m_a with a center of gravity spaced r_a from the axis of said shaft, said second plane being spaced a distance a from said reference plane, helical springs for resiliently mounting said unit, said springs engaging said unit in a third plane on the opposite side of said reference plane relative to said compressor part, said third plane being spaced a distance Z from said reference plane, the product $m_a \cdot r_a$ being scaled so that said unit has its minimal radial deflection in said third plane.

4,118,154

HYDRAULICALLY ACTUATED PUMP ASSEMBLY

George K. Roeder, Box 4335, Odessa, Tex. 79760

Filed May 24, 1976, Ser. No. 689,576
Int. Cl.[2] F04B *17/00, 35/00;* F01L *15/12;* F01B *7/18*
U.S. Cl. 417—402 **6 Claims**



1. In a downhole, fluid actuated pump assembly having an engine and a production pump, with the production pump having a formation fluid inlet and a produced fluid outlet; and, with the engine having a power fluid inlet and a spent power fluid outlet; the improvement comprising:

said engine having a cylindrical bore, an engine piston reciprocatingly received within said cylindrical bore and dividing said cylindrical bore into upper and lower engine chambers; said piston having an axial bore; a control rod, a valve element, said control rod being reciprocatingly and concentrically received within said piston and within said valve element; said valve element being reciprocatingly received within said axial bore of said piston such that the valve element can move between alternate positions;

spaced abutment means positioned at opposed ends of said cylindrical bore, opposed ends of said control rod contact said spaced abutment means to shift said control rod respective to said piston between an upper and a lower position as said piston reciprocates within said cylindrical bore;

means forming a flow passageway from said lower engine chamber to said valve element, means forming a flow passageway from the power fluid inlet to said valve element, means forming a spent power fluid flow passageway from said valve element to the spent power fluid outlet;

means by which said upper engine chamber is connected to a source of fluid for reciprocating said piston in a downward direction within said cylindrical bore;

means on said control rod and said valve element by which power fluid causes said valve element to shift from one to another of said alternate positions in response to said control rod being shifted from one to another of said upper and lower positions;

said production pump includes a production barrel, a production piston reciprocatingly received within said barrel and connected to said engine piston, said production piston dividing said barrel into upper and lower production chambers; means connecting said upper production chamber to said lower engine chamber; said upper engine chamber is directly connected to said production fluid outlet;

so that said lower engine chamber is alternately connected to said power fluid source and said production fluid outlet; to thereby cause the engine piston to reciprocate the production piston.

4,118,155
FUEL PUMPING APPARATUS

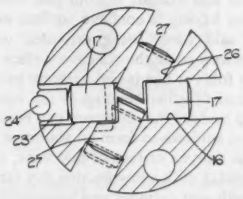
Dorian Farrar Mowbray, Burnham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 14, 1977, Ser. No. 787,351

Claims priority, application United Kingdom, Apr. 20, 1976, 15897/76

Int. Cl.² F04B *19/02*

U.S. Cl. 417—462 **4 Claims**



1. A liquid fuel pumping apparatus for supplying fuel to an internal combustion engine and of the kind comprising a rotary distributor member located within a housing, a diametrically disposed bore formed in the distributor member, a pair of plungers slidable within the bore, inlet and outlet passages in the distributor member through which liquid fuel is conveyed to and from a space defined between the plungers, an annular cam ring surrounding the distributor member, cam lobes formed on the internal periphery of the cam ring, for imparting simultaneous inward movement to the plungers as the distributor member is rotated, a second diametrically disposed bore in the distributor member, said second bore having its longitudinal axis intersecting the longitudinal axis of the first mentioned bore at the axis of rotation of the distributor member, a further pair of plungers in said further bore, one of said pairs of plungers defining recesses into which the plungers of the other pair can move as the plungers are mored inwardly by the cam lobes whereby the plungers can be moved inwardly an additional amount without collision.

4,118,156
FUEL INJECTION PUMP HAVING CHOKE MEANS IN OVERFLOW LINE

Strahinja Ivosevic, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 1, 1976, Ser. No. 746,426

Int. Cl.² F04B *7/04, 39/10*

U.S. Cl. 417—494 **6 Claims**

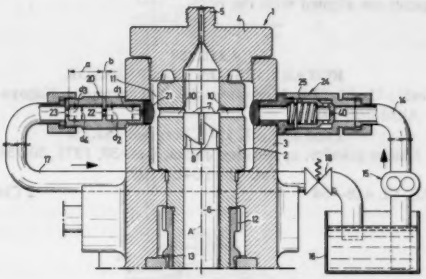
1. A fuel injection system for a diesel engine comprising

an injection pump having a cylinder, defining an injection chamber, a fuel collecting chamber surrounding said cylinder, a plurality of control ports in said cylinder to communicate said collecting chamber with said injection chamber, a piston reciprocally mounted in said cylinder, said piston having control edges cooperating with said control ports to control a start and an end of an injection process;

a feed pump for pumping fuel;

a feed line between said feed pump and said collecting chamber for delivering a flow of pumped fuel to said collecting chamber;

an overflow line for receiving an overflow of fuel from said injection pump;



a choke means having three choke points disposed in series and being located in an input of said overflow line, said choke points having respective flow apertures of increasing cross-sectional area in the flow direction; and

a shut-off means for preventing a pressure wave produced during overflow from entering said feed line.

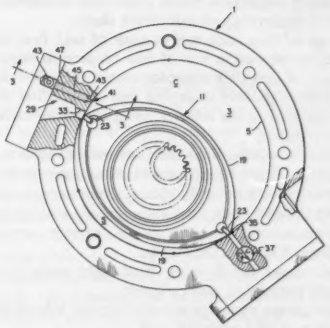
4,118,157
ROTARY COMPRESSOR

Endre A. Mayer, Birmingham, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 541,021, Jan. 14, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 759,690

Int. Cl.² F01C *1/02, 21/04, 21/12;* **F04C** *17/02*

U.S. Cl. 418—1 **10 Claims**



1. A method of compressing fluid using a rotary fluid compressor including a housing having an inlet port, an outlet port including a check valve, a rotor rotatable in a cavity defined within said housing, said rotor having a pair of opposed apexes engaging the wall of said cavity to divide the latter into a pair of chambers, said method comprising the steps of communicating one of the chambers with the inlet port and the other chamber with said outlet port, rotating said rotor to compress the fluid in said other chamber with said check valve open until the rotor attains a minimum volume position in which the volume of said other chamber is minimized, closing said check valve as said rotor rotates past said minimum volume position to trap a volume of fluid in said other chamber, continuing to rotate said rotor past said minimum volume position with said check valve closed to expand the volume of said other chamber to thereby reduce the pressure of the fluid trapped therein until one of the apexes thereof is opposite said outlet port and

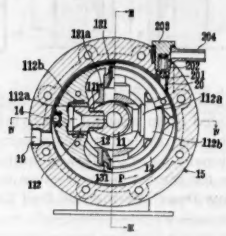
the other of said apexes is opposite the inlet port, simultaneously communicating said inlet and outlet ports with both of said chambers when the apexes of the rotor are aligned with said ports, and closing communication between the one chamber and the inlet port and between the other chamber and the outlet port as the rotor is rotated past the position in which the apexes are aligned with the ports.

4,118,158

ROTARY PISTON COMPRESSOR

Toshio Osaki, 21-8, Momofune-cho, Nakagawa-ku, Nagoya-shi, Aichi-ken, Japan

Filed Dec. 21, 1976, Ser. No. 752,750
Claims priority, application Japan, Dec. 30, 1975, 50-156236
Int. Cl.[2] F04C *1/02*
U.S. Cl. 418—54 **2 Claims**



1. A rotary piston compressor comprising
(a) a cylinder;
(b) a drive shaft having a portion within said cylinder, both ends of said portion being supported on bearings;
(c) a rotary piston positioned within said cylinder;
(d) a correcting shaft surrounding a portion of said drive shaft both ends of said correcting shaft being supported by bearings;
(e) a pair of projection means positioned on opposite sides of the circumference of said drive shaft;
(f) a pair of first slide means each of said first slide means being positioned in one of said projection means;
(g) a pair of first slide acceptor means each first slide acceptor means slidably engaging one of said first slide means and secured to the interior circumferential surface of said rotary piston;
(h) a pair of second slide acceptor means, each second slide acceptor means being formed on said correcting shaft;
(i) a pair of second slide means, each second slide means being slidably engaged by one of said second slide acceptor means and secured to the interior circumferential surface of said rotary piston;
(j) seal means for forming fluid tight seals between said rotary piston and said cylinder;
(k) fluid intake means positioned on one side of the circumference of said cylinder; and
(l) fluid discharge means positioned on an opposite side of the circumference of said cylinder said discharge means including a discharge valve.

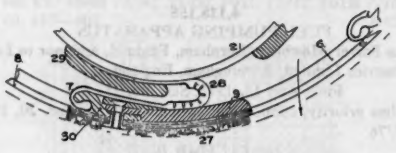
4,118,159

ROTARY PISTON MACHINE

John Allan, Skanor, West Hill, Bembridge, Isle of Wight, England

Filed Nov. 21, 1975, Ser. No. 634,065
Int. Cl.[2] F04C *5/00*
U.S. Cl. 418—153 **21 Claims**

1. A rotary machine for selectively providing internal compression or expansion to a fluid and selectively connectable to a driving or driven shaft, said rotary machine comprising a cylinder rotatable about its axis, a piston within the cylinder rotatable synchronously with the cylinder about an axis parallel to but offset from the axis of rotation of the cylinder, cylinder end boundaries between said piston and said cylinder, a series of flexible vanes each constructed from elastomerically coated fibrous material spanning the gap between the inner surface of the cylinder and the outer surface of the piston and controlled in deflection by geometrical and pressure changes each of which is without recourse to liquid additives in sealable rubbing contact with said cylinder end boundaries and sealably connected to the surfaces of said cylinder and said piston, each vane sweeping the space between said cylinder and piston surfaces and said cylinder end boundaries, each pair of adjacent vanes defining with the said cylinder and piston surfaces a chamber for a fluid medium which during each revolution of



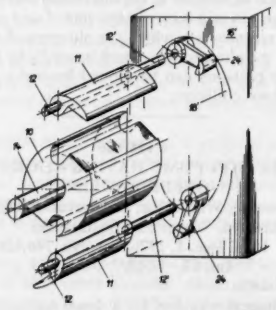
said cylinder varies in volume to selectively compress or expand fluid ingested and exhaust it from said rotary machine, each of said vanes having a concave surface and a convex surface, each of said vanes being provided with adjacent spaced projections formed on the concave surface of each vane so that as the vane folds or bends said adjacent projections butt one another and resist further bending of the vane and where an arch so formed bridges the minimum gap between the said cylinder and piston surfaces to form an abutment against fluid loads acting on the convex surface of said vane, and said vane having edges provided with a low friction dry rubbing surface at their contact with said cylinder end boundaries.

4,118,160

ROTARY MACHINE WITH CONTROLLED RETRACTABLE PIVOTED MEMBERS SUCH AS BLADES OR PISTONS

Lucien Baudin, Paris, France, assignor to Idram Engineering Company Est., Switzerland

Filed Sep. 6, 1977, Ser. No. 831,060
Claims priority, application Switzerland, Oct. 11, 1976, 12847/76
Int. Cl.[2] F04C *29/10*
U.S. Cl. 418—260 **2 Claims**



1. A rotary machine with controlled retractable blades or pistons, and comprising a rotor, the blades being pivotally mounted on the rotor, a stator inside which the rotor turns, with the blades or pistons cooperating with the inside cylindrical wall of the stator, and a mechanism controlling the angular position of the blades in relation to their pivoting axis on the rotor, wherein the mechanism controlling the angular position of the retractable members comprises at least one arm fastened

to the corresponding retractable member and comprising a surface cooperating under the action of centrifugal force with a surface of revolution whose axis is eccentric in relation to the axis of the rotor.

4,118,161

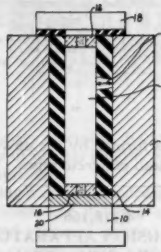
HIGH TEMPERATURE, HIGH PRESSURE APPARATUS HAVING A DUCTILE DRIVER ELEMENT

George C. Kennedy, Los Angeles, Calif., assignor to Kennametal Inc., Latrobe, Pa.

Continuation-in-part of Ser. No. 586,415, Jun. 12, 1975, abandoned. This application May 20, 1977, Ser. No. 798,767

Int. Cl.[2] B30B *11/32*

U.S. Cl. 425—77 **6 Claims**



1. In a high pressure, high temperature pistoncylinder apparatus which includes a chamber open at the ends and having closure means for closing the ends of said chamber with at least one said closure means comprising a piston closely slidably fitted in said chamber, a sleeve having an opening therethrough and of electrical insulating material in said chamber extending from one closure toward the other thereof and adapted to receive a core of charge material therein, and means for heating a core of charge material in said sleeve, the improvement which comprises; an electrically conductive driver element confined in the chamber between one axial radial outward end of said sleeve and the adjacent closure means, said driver element being operable in response to the application of pressure thereto by advancing movement of the piston into the chamber to deform and flow into the adjacent end of said opening of said sleeve without substantial deformation of said sleeve.

4,118,162

APPARATUS FOR MANUFACTURING LENGTHS OF RUBBER HOSE OF CURVED SHAPE

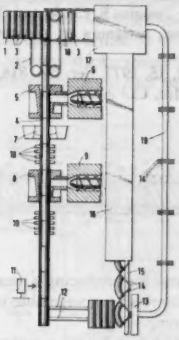
Wilfried Baumgarten, Pattensen, Fed. Rep. of Germany, assignor to Paul Troester Maschinenfabrik, Fed. Rep. of Germany

Filed Oct. 6, 1976, Ser. No. 730,002

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—113 **13 Claims**

1. Apparatus for manufacturing lengths of rubber hose of curved shape, comprising rubber extrusion apparatus, means operatively associated with said extrusion apparatus for feeding to and through said extrusion apparatus a sequence of flexible mandrels in end-to-end relation for extrusion onto said mandrels of a continuous rubber hose, means downstream of said extrusion apparatus for cutting said hose at locations between successive mandrels to form hose lengths each having a flexible mandrel therein, means downstream of said cutting means for bending successive mandrels with said hose lengths thereon into curved form and means for vulcanizing said hose lengths while held in curved form by said mandrels to form



vulcanized rubber hose of curved shape, said mandrels being thereafter removed from said curved hose lengths.

4,118,163

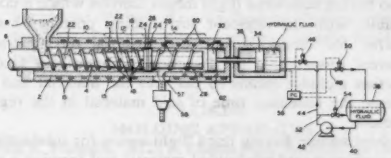
PLASTIC EXTRUSION AND APPARATUS

Soo-Il Lee, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 11, 1977, Ser. No. 814,524

Int. Cl.[2] B29F *3/06*

U.S. Cl. 425—146 **10 Claims**



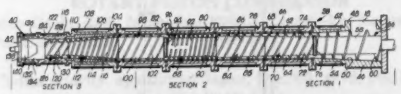
1. Screw extruder apparatus for plasticizing thermoplastic material and issuing said material from an orifice comprising an elongated hollow barrel having an axial bore therein adapted to receive raw thermoplastic material from a source thereof and containing an axially disposed, rotatable extruder screw for plasticizing, advancing and melting thermoplastic material, a passage communicating with said bore and operatively connecting an exit orifice with said bore, said barrel having a low pressure end where raw thermoplastic material is received and a high pressure end from which plasticized melted material is delivered to said passage, said screw containing an elongated hollow internal axial cavity, bored through the end of the screw that is positioned in the high pressure end of said barrel and extending part way toward said low pressure end, seal means intermediate the ends of the hollow portion of the screw which prevents passage of plastic material across said seal means between said barrel and said screw, lateral passageways through the shaft of said screw, leading into said axial cavity from near the pushing side of the flights of said screw that are adjacent said axial cavity and are on the low pressure side of said seal means, the flights of said screw between said low pressure end and said seal means being pitched to advance plastic toward said seal and the flights of said screw that are on the high pressure side of said seal means being oppositely pitched to advance toward said seal means the material that issues through the end of the screw from said cavity, said passage connecting said bore and said orifice being located in the sidewall of said barrel near the high pressure side of said seal means.

4,118,164

HIGH-OUTPUT APPARATUS FOR PRODUCING DENSE, UNIFORMLY LAYERED MEAT ANALOGUE PRODUCT

La Von Gene Wenger; Douglas S. Clark, and Bobbie W. Hauck, all of Sabetha, Kans., assignors to Wenger Manufacturing, Sabetha, Kans.

Filed Jul. 15, 1977, Ser. No. 816,005
Int. Cl.[2] A23P *1/00*
U.S. Cl. 425—202 **17 Claims**



1. Extrusion apparatus for producing a meat analogue product from a mixture comprising a vegetable protein and moisture, said apparatus comprising:

an elongated, tubular barrel having a material inlet adjacent one end thereof and an extrusion die adjacent the remaining end thereof; and

an elongated, axially rotatable screw positioned within said barrel for moving said material from said inlet towards and through said die,

said screw including first, second and third longitudinally aligned sections,

said first screw section having first flight means for moving said material from said inlet along the length of said barrel towards said second screw section,

said second section having second flight means for compacting the material received from said first section, forming a first choke of the material within the barrel, said section also having additional flight means thereon which is cooperable, with the adjacent surrounding portion of said barrel, for subdivision of said material during travel thereof toward said third section, wherein said second section includes means to cut into the material and increase the residence time of said material in the region thereof.

said third section having third flight means for substantially recombining said subdivided material and forming a second choke of said material within the barrel.

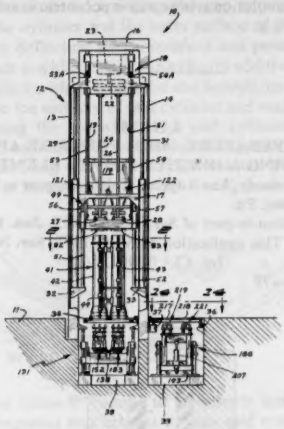
4,118,165

PACKERHEAD PIPE MAKING MACHINE

Alfred Christian, W. Woodstock, Canada, assignor to Hydrotile Canada Limited, Woodstock, Canada

Filed Dec. 22, 1976, Ser. No. 753,526
Int. Cl.[2] B28B *21/26*
U.S. Cl. 425—262 **46 Claims**

1. An apparatus for simultaneously making two concrete pipes comprising: an upright frame, a turntable located adjacent the frame, a form assembly having a first upright jacket surrounding a first chamber and a second upright jacket surrounding a second chamber mounted on the turntable, a single cross head means movably mounted on the frame for movement in a vertical direction, a pair of rotatable shafts connected to said single cross head means and extended downwardly from the cross head means, packer heads connected to the lower ends of the shafts in laterally spaced relation, said turntable-carried first and second jackets having a like laterally spaced relation whereby when said turntable is rotated to position said jackets in respective vertical alignment with said packer heads, one packer head is positionable in the first chamber and the other packer head is positionable in the second chamber, said cross head means supporting drive means for rotating the shafts and packer heads, means located above the form assembly for delivering concrete to the chambers, and means connected to the cross head means and frame for selectively moving the cross head means in a downward direction to locate the packer heads in the lower ends of the jackets and an upward direction to move the packer heads upwardly relative to the jackets whereby the concrete delivered into the first



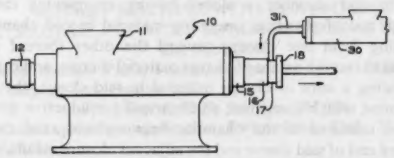
and second chambers is formed by the upwardly moving and rotating packer heads into concrete pipes.

4,118,166

EXTRUSION APPARATUS

David Edward Bartrum, Bay Village, Ohio, assignor to The BF Goodrich Company, Akron, Ohio

Filed Jul. 22, 1977, Ser. No. 818,175
Int. Cl.[2] B29F *3/04*
U.S. Cl. 425—462 **7 Claims**

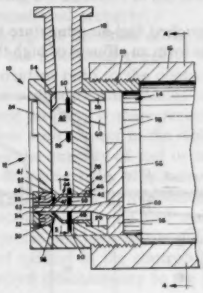


1. An extrusion die head having a neck block for connection to the outlet end of an extruder, said neck block having a cylindrical bore at one end thereof and an oblong bore at the other end thereof, said cylindrical bore tapering into said oblong bore, a shaping block secured to said neck block, said shaping block having an oblong bore at one end mating with said oblong bore of said neck block, said shaping block having a preformed laterally extending generally L-shaped thin passageway at the other end thereof, said oblong bore of said shaping block tapering laterally outwardly in both directions to merge smoothly with said L-shaped passageway, a thin width feed block mounted adjacent to said shaping block, said feed block having an L-shaped passageway identical in size and shape to said L-shaped passageway of said shaping block extending therethrough, a die block mounted adjacent to said feed block having an L-shaped passageway at one end thereof, said L-shaped passageway of said die block merging with said L-shaped passageway of said feed block, a thin L-shaped orifice at the other end of said die block for shaping extrudate therefrom, said L-shaped passageway of said die block tapering downwardly in thickness to form said thin orifice, said feedblock having a second passageway communicating with said L-shaped passageway therein, and said second passageway being in alignment with and communicating with said L-shaped passageway in said feed block for depositing a thin film of extrudate onto the extrudate passing through said L-shaped passageway in said feeder block.

4,118,167
COEXTRUSION DIE

Arnold S. Lund, and Thomas L. Stroh, both of Cadillac, Mich., assignors to Cadillac Rubber & Plastics, Inc., Cadillac, Mich.

Filed Jan. 28, 1976, Ser. No. 652,980
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—463 **19 Claims**



1. A multiple-cavity extrusion die for simultaneously coextruding a plurality of tubular lengths of rubbery material, said extrusion die comprising:

a housing defining a common extrusion cavity, said housing including a front face defining a plurality of separate, laterally spaced openings therein;

means defining core mandrels extending at least into the openings of the front face of the housing;

first extrusion means having a first outer diameter orifice within the housing for extruding a first rubbery material onto each of the core mandrels to form a relatively thin tubular core shape of such material;

second extrusion means having a second outer diameter orifice greater than the first diameter within the housing at the outlet of the first extrusion means for extruding a relatively thicker layer of a second rubbery material onto each of the tubular core shapes as the core shapes are extruded to provide a relatively thicker tubular cover for each of the tubular core shapes; and

means within the housing for individually adjusting the speed of each of the composite tubular shapes without significantly affecting the thicknesses of the tubular cover and the tubular core shape so that each of the tubular composite shapes is extruded at a uniform rate despite variations in the pressure of the second rubbery material at the respective second extrusion means thereof.

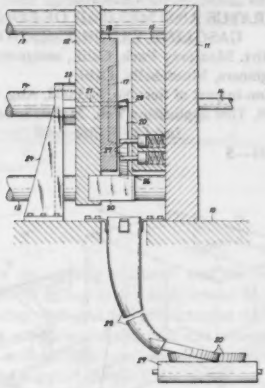
4,118,168
GUIDANCE SYSTEM FOR SHALLOW ARTICLES DISCHARGED FROM A MOLD CAVITY

Herbert Rees, Willowdale, and Robert Dietrich Schad, Schomberg, both of Canada, assignors to Husky Injection Molding Systems Limited, Bolton, Canada

Filed May 2, 1977, Ser. No. 792,997
Int. Cl.[2] B29F *1/14*
U.S. Cl. 425—556 **13 Claims**

1. In an injection-molding machine including a mold with a first and a second mold portion having substantially vertical confronting surfaces, one of said surfaces being formed with at least one shallow cavity, reciprocable drive means coupled with said first mold portion for displacing same relatively to said second mold portion between a mold-open position and a mold-closed position, injection means connected to said second mold portion for filling said cavity in said mold-closed position with a flowable mass hardening into a molded article, and ejection means on the mold portion formed with said cavity for discharging the molded article therefrom,

the combination therewith of guide means on at least one of said mold portions projecting in said mold-open position toward the other of said mold portions on opposite sides of said cavity and at least in part below the level thereof to define with the confronting surfaces of the separated mold portions a substantially vertical channel for the controlled descent of the ejected article to a receiver therefor, said drive means having a stroke which limits the separation of said confronting surfaces in said mold-open position to a

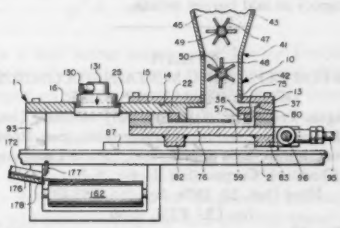


distance greater than the depth of said cavity perpendicular to said surfaces but less than the dimensions of said cavity parallel to said surfaces whereby the descending article is maintained substantially in its original upright orientation within said channel, said guide means including at least one pair of cavity-flanking elements retractable into said one of said mold portions in said mold-closed position.

4,118,169
MOLDING APPARATUS

Jerald R. Haluska, 14729 S. Clifton Park, Midlothian, Ill. 60445

Filed Jan. 17, 1977, Ser. No. 764,900
Int. Cl.[2] A22C *7/00*
U.S. Cl. 425—583 **8 Claims**



1. Molding apparatus comprising a support, a mold having a stationary section secured to the support and a movable section, means associated with the movable section for moving said movable section between product-receiving and mold filling positions, one of said sections having a mold cavity and the other of said sections having inlet means and passage means leading from the inlet means, supply means communicating with the inlet means for charging the same with a predetermined quantity of product, means associated with said one section operable for scavenging the product in said inlet means and compressing it into the passage means and having means operable for closing off of said supply means to said inlet means, means communicating said passage means into said mold cavity upon relative movement of said movable section

from product-receiving position to mold-filling position, and return means in said other section operable for recirculating excess product in said inlet means and passage means through said supply means, and means selectively throttling said return means for controlling compaction overflow of the product in the mold cavity.

4,118,170

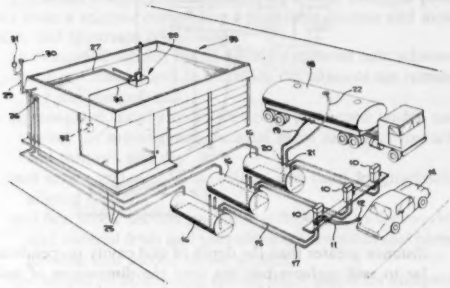
APPARATUS AND METHOD OF CONTROLLING GASOLINE VAPOR EMISSIONS

John H. Hirt, Monterey Park, Calif., assignor to Hirt Combustion Engineers, Montebello, Calif.

Continuation-in-part of Ser. No. 603,002, Aug. 8, 1975, Pat. No. 4,009,985. This application Feb. 24, 1977, Ser. No. 771,573

Int. Cl.[2] F23G 7/06

U.S. Cl. 431—5 **11 Claims**



1. In a method of abatement of vapors emitted from a storage container during transfer of fluids including liquids and vapors to or from said container, said storage container having a vent means to atmosphere and wherein pressure of said vapors in said vent means is sensed to cause such vapors to be directed at a preselected pressure along a path to a burning means, a pressure air source providing combustion air which is directed to said burner means when said preselected vapor pressure is sensed, and igniting and burning a mixture of vapors and air at said burning means, including the steps of:

providing a valve means in the path of said vapors to said burning means for controlling flow of said vapors;

and actuating said valve means by pressure air from said air source only when such pressure air is available to pump said vapors to said burner means.

4,118,171

METHOD FOR EFFECTING SUSTAINED COMBUSTION OF CARBONACEOUS FUEL

Paul Flanagan, Princeton, N.J.; Eric Roy Norster, Lexington, Mass.; Robert V. Carrubba, Bridgewater, and Ronald M. Heck, Frenchtown, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Dec. 22, 1976, Ser. No. 753,499

Int. Cl.[2] F23L 9/00

U.S. Cl. 431—10 **12 Claims**

1. A method for effecting sustained combustion of a carbonaceous fuel at predetermined total rates of fuel demand, utilizing combustion apparatus including a thermal combustion zone and downstream thereof in succession a mixing zone and a catalyst zone, wherein for at least one of said total rates of fuel demand substantial portions of said fuel are burned in each of said thermal combustion zone and said catalyst zone, comprising:

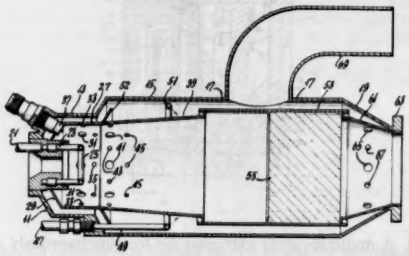
supplying, during operation at said one fuel demand rate, a substantial portion of the fuel to said thermal combustion zone while simultaneously supplying air to said thermal combustion zone to effect substantially complete combustion therein of the fuel being supplied thereto with formation of a heated effluent;

adding to said heated effluent in an upstream portion of said mixing zone an additional amount of relatively cool air to obtain a cooled mixture;

adding to said cooled mixture passing through a downstream portion of said mixing zone a substantial additional portion of said fuel, making up the total needed for said one fuel demand rate, to provide an enriched fuel-air admixture;

passing said enriched fuel-air admixture through said mixing zone to the catalyst without substantial recirculation or stagnation; and

combusting said enriched fuel-air admixture in the presence of said catalyst to form an effluent of high thermal energy,



said additional amount of air being sufficient to maintain said cooled mixture and said enriched fuel-air admixture at temperatures within the range of about 500°–1200° F. in said mixing zone, thus avoiding any preignition or preburning of said additional fuel, and

the resulting fuel-air admixture having an adiabatic flame temperature such that, upon contact with said catalyst, the operating temperature of said catalyst is substantially above the instantaneous auto-ignition temperature of said fuel-air admixture but below a temperature that would result in any substantial formation of oxides of nitrogen.

4,118,172

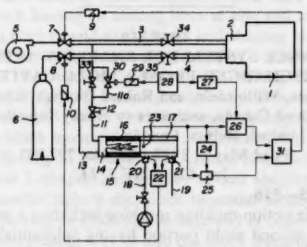
METHOD AND APPARATUS FOR CONTROLLING BURNER STOICHIOMETRY

Dominique Noir, Nyon, Switzerland, and John Meier, San Diego, Calif., assignors to Battelle Development Corporation, Columbus, Ohio

Filed Oct. 20, 1976, Ser. No. 734,176

Int. Cl.[2] F23N 5/10

U.S. Cl. 431—12 **3 Claims**



1. A method for continuously controlling a gaseous mixture comprising an oxidant and a fuel of variable composition or variable heating value to a predetermined stoichiometry in a main burner comprising,

(A) burning a quantity of the fuel and the oxidant in a control burner in parallel with said main burner,

(B) monitoring the change in magnitude of a property of the burning or the burned fuel and oxidant in the control burner, said property having a maximum value as a func-

tion of the fuel to oxidant ratio at about the stoichiometric ratio,

(C) adjusting the fuel to oxidant ratio to the control burner to substantially maximize the magnitude of the monitored property by the steps comprising

(a) periodically inducing a variation in the fuel to oxidant ratio in the control burner,

(b) measuring the direction of the change in the magnitude of the monitored property,

(c) comparing the direction of the change in the magnitude of the monitored property with the variation in fuel to oxidant ratio to the control burner whereby to determine whether the change in magnitude of the monitored property is characteristic of an excess of fuel or oxidant with respect to the stoichiometric ratio,

(d) varying the quantity of fuel or oxidant in the control burner to substantially eliminate the excess of fuel or oxidant with respect to the stoichiometric ratio, and

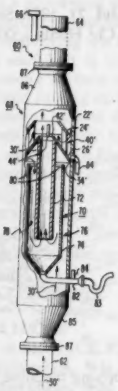
(D) simultaneously supplying said main burner with independent, preset multiples of the quantity of fuel and the quantity of oxidant in the control burner such that said predetermined stoichiometry to the main burner is maintained.

4,118,173

UNIDIRECTIONAL SEAL FOR FLOW PASSAGES

Hosein M. Shakiba, Philadelphia, Pa., assignor to Samuel Lebidine, Glassboro, N.J., a part interest

Filed Aug. 8, 1977, Ser. No. 822,948
Int. Cl.[2] F23D *13/20*
U.S. Cl. 431—202 **21 Claims**



1. A flare system for exhaust gases comprising:

a tubular exhaust passage including a flare stack and tip having a burner at its exhaust end and a pilot for ignition of flare gas at said burner;

and a unidirectional seal in said exhaust passage including a plurality of inclined surfaces mounted in said passage to permit normal flare gas flow through said passage and past said inclined surfaces, and positioned to incline towards the axis of said passage in the direction of said normal flare gas flow,

upstream and downstream ones of said inclined surfaces being mounted adjacent each other,

said upstream inclined surface being in substantially sealed relation with an inner surface of said exhaust passage,

said downstream inclined surface being mounted in spaced relation to said inner passage surface and to said upstream inclined surface so as to direct counterflow of air between said downstream and inner surfaces and between said upstream and downstream inclined surfaces,

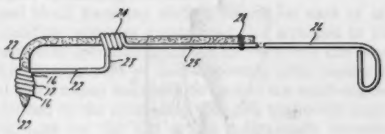
whereby counterflow of air through said flare stack is restricted.

4,118,174

WICK LIGHTER WITH WAX HOLDER

Michael Shirak, 5480 Springwells, Detroit, Mich. 48210

Filed Mar. 1, 1977, Ser. No. 773,207
Int. Cl.[2] F23D *13/16*
U.S. Cl. 431—289 **8 Claims**



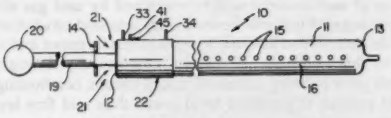
1. In a lighter for igniting a candle and the like, a wire formed into a handle at one end, a coil wound from turns of said wire at the other end, said coil projecting at right angles to said wire, a wick supported in said coil, and wherein the central turns of said coils are of greater diameter than the end turns which engage and support the wick.

4,118,175

FUEL BURNER, ARRANGEMENT AND SLEEVE THEREFOR AND METHODS

Fred Riehl, Greensburg, Pa., assignor to Robertshaw Control Company, Richmond, Va.

Filed Dec. 27, 1976, Ser. No. 754,114
Int. Cl.[2] F23D *13/40*
U.S. Cl. 431—354 **20 Claims**



1. In a fuel burner arrangement having a tubular burner provided with opening means at one end thereof and a sleeve telescoped on said burner for sliding relative thereto to progressively cover and uncover said opening means and thereby provide an adjustable air shutter arrangement, said sleeve having opposed ends and a longitudinal slot splitting said sleeve from one of said ends to the other of said ends and thereby defining two adjacent longitudinal slot edges of said sleeve, said sleeve having a natural bias that causes said sleeve to grip said tubular burner and tend to move said longitudinal edges thereof together whereby said sleeve tends to frictionally remain in its telescoped position on said tubular burner by its natural gripping bias, said sleeve having tab means on said longitudinal edges for facilitating the spreading apart of said longitudinal edges and thereby permit easy sliding of said sleeve relative to said tubular burner, said tubular burner having a projection means extending therefrom and being received through said slot of said sleeve to guide longitudinal sliding movement of said sleeve relative to said burner, the improvement wherein said sleeve has opposed stop means for respectively engaging said projection means of said burner to limit longitudinal sliding movement of said sleeve in opposite directions on said tubular burner, said stop means comprising inward steps in said longitudinal edges of said sleeve.

4,118,176

HEAT TREATMENT FOR FINE-GRAINED MATERIALS

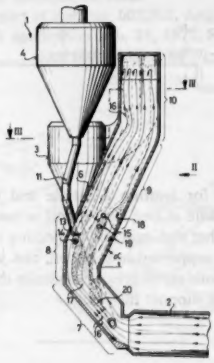
Hans Mollenkopf, Neubeckum; Horst Ritzmann, Enniger; Jürgen Wurr, Ennigerloh; Heinz-Herbert Schmits, Rheda; Otto Heinemann, Ennigerloh; Karl Krützner, ön., Neubeckum, and Werner Schossler, Ahlen, all of Fed. Rep. of Germany, assignors to Polysius AG, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 774,881

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611239

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—14 18 Claims



13. A method for the further heat treatment of fine-grained material previously heated in a preheater and prior to firing said material in a furnace having an upwardly extending hot waste gas conduit, said method comprising discharging hot gas in a stream from said furnace at a predetermined velocity, deflecting said stream upwardly through said conduit to establish a relatively highly concentrated portion thereof adjacent one side of said conduit and a relatively lesser concentrated portion adjacent the opposite side of said conduit; supplying fine-grained material having a grain size such that a substantial portion of said material will be entrained by said gas stream; introducing said material downwardly into said conduit at said one side thereof and at a first level between its upper and lower ends so that said material will fall downwardly through said conduit prior to being entrained in said stream; combusting fuel in said conduit at a second level lower than said first level to provide a heating zone through which said material passes as it falls downwardly and through which said material passes again following its being entrained in said stream; and terminating said deflection of said stream in the region of said first level to deconcentrate said concentrated portion of said stream whereby a portion of the material entrained in said stream may fall again through said conduit adjacent the opposite side thereof and be reentrained in said stream at a level below that of said heating zone for further passage through said heating zone.

4,118,177

APPARATUS AND METHOD FOR CALCINING OR SINTERING FINE-GRAINED MATERIAL

Paul Weber, Oelde; Erich Lankes, Ennigerloh; Gerhard Butschko, Hamm; Horst Ritzmann, Enniger, and Peter Wolfgang Bohm, Oelde-Stromberg, all of Fed. Rep. of Germany, assignors to Polysius AG, Neubeckum, Fed. Rep. of Germany

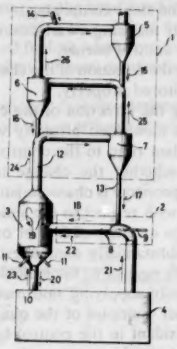
Filed Nov. 8, 1976, Ser. No. 739,543

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1975, 2550469; Nov. 10, 1975, 2550384; Nov. 10, 1975, 2550418

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—14 13 Claims

10. In a method of heat treating fine-grained materials such as alumina, lime, dolomite, magnesite, and the like, wherein said material is preheated, then subjected to hot gases heated to such temperature as to raise the temperature of the preheated material to a calcining or sintering temperature, and then separated from the hot gases and subsequently cooled, the improvement comprising heating said material for a second time to a calcining or sintering temperature prior to its separation from said hot gases, thereby subjecting said material to two consecutive heating stages.



4,118,178

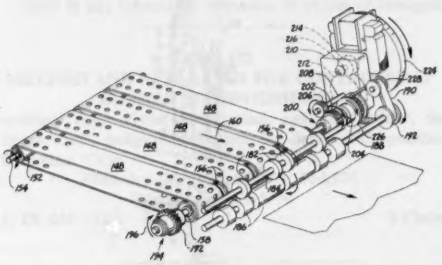
XEROGRAPHIC FUSING APPARATUS

Salvatore J. Calvi, Ridgefield, and John J. Stelben, Greenwich, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jul. 21, 1977, Ser. No. 817,713

Int. Cl.[2] H05B *3/00*; G01P *3/00*

U.S. Cl. 432—35 6 Claims



1. For use in a copying machine having an electrically operated drive system, fusing apparatus for fusing zerographic developing material to a sheet of support material to permanently affix the developing material thereto, said fusing apparatus comprising:

A. a frame,

B. heating means mounted on said frame and operable when energized to generate sufficient heat to cause the xerographic developing material to melt and become fused to the sheet of support material,

C. conveyor means mounted on said frame in operative association with said heating means for conveying a sheet of support material past said heating means for fusing the xerographic developing material thereto while the sheet of support material is moving past said heating means,

D. primary driving means connected to said conveyor means and operable to drive said conveyor means at a predetermined velocity when said primary driving means is operatively associated with the drive system of the copying machine,

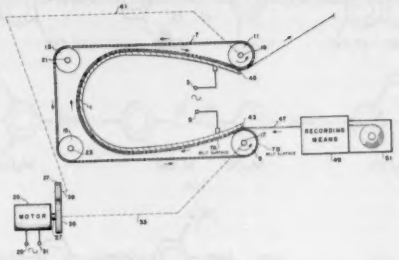
E. secondary driving means connected to said conveyor

means and being automatically operable to drive said conveyor means in the event of a failure in the electrically operated drive system of the copying machine for a period of time at least sufficient to convey the sheet of support material past said heating means to prevent combustion of the sheet of support material.

4,118,179
MATERIAL PROCESSOR WITH RELATIVE MOVEMENT BETWEEN MATERIAL AND ITS POSITIONER

Dale O. Ballinger, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 8, 1976, Ser. No. 748,667
Int. Cl.[2] F27B 9/28
U.S. Cl. 432—59 **12 Claims**

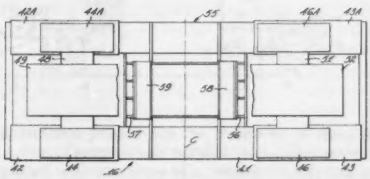


1. Processing apparatus for sheet material, comprising processing means having a processing surface,
a belt having a driving surface arranged in driving contact with said material for conveying the latter over said processing surface when said belt is moved along a path adjacent to said processing surface, said belt tending to transfer the texture of said driving surface to said material when the latter is contacted by said driving surface, and
means for moving said belt along said path so that said belt leaves said processing surface at a higher speed than that at which said belt arrives at said processing surface, and thus elongates progressively as it moves along said path,
whereby said belt moves said material relative to said processing surface and simultaneously moves along said material to minimize the transfer of said texture of said driving surface to said material.

4,118,180
ROTARY KILN SERVICE STANDS

Robert M. Bliemeister, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 6, 1977, Ser. No. 794,476
Int. Cl.[2] F27B 7/22
U.S. Cl. 432—103 **7 Claims**

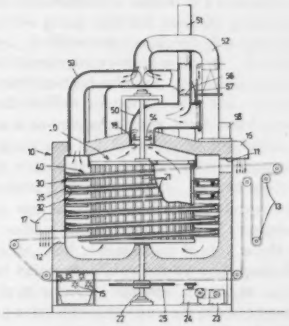


1. In a supporting arrangement for a rotary kiln having an axis of rotation;
a base;
support roller means mounted for movement from a kiln supporting position to a retracted service position wherein said support roller means is not in engagement with the kiln; and,
stationary support means in position to receive and support the kiln when said support roller means are moved out of supporting engagement with the kiln,
said stationary supporting means includes a pedestal supported on said base in position to receive and support said kiln when said supporting roller means is retracted to a servicing position, said pedestal includes a pair of spaced apart upstanding members;
a pad block receiving surface formed on each of said upstanding members constructed and arranged to provide adequate operating clearance for the rotary kiln when said kiln is supported by said supporting roller means; and
pad block means insertable on each of the receiving surfaces formed on the upstanding members to provide supporting surfaces for the kiln which substantially increases the clearance distance between the pad block receiving surfaces and the kiln when said supporting roller means is in operating position.

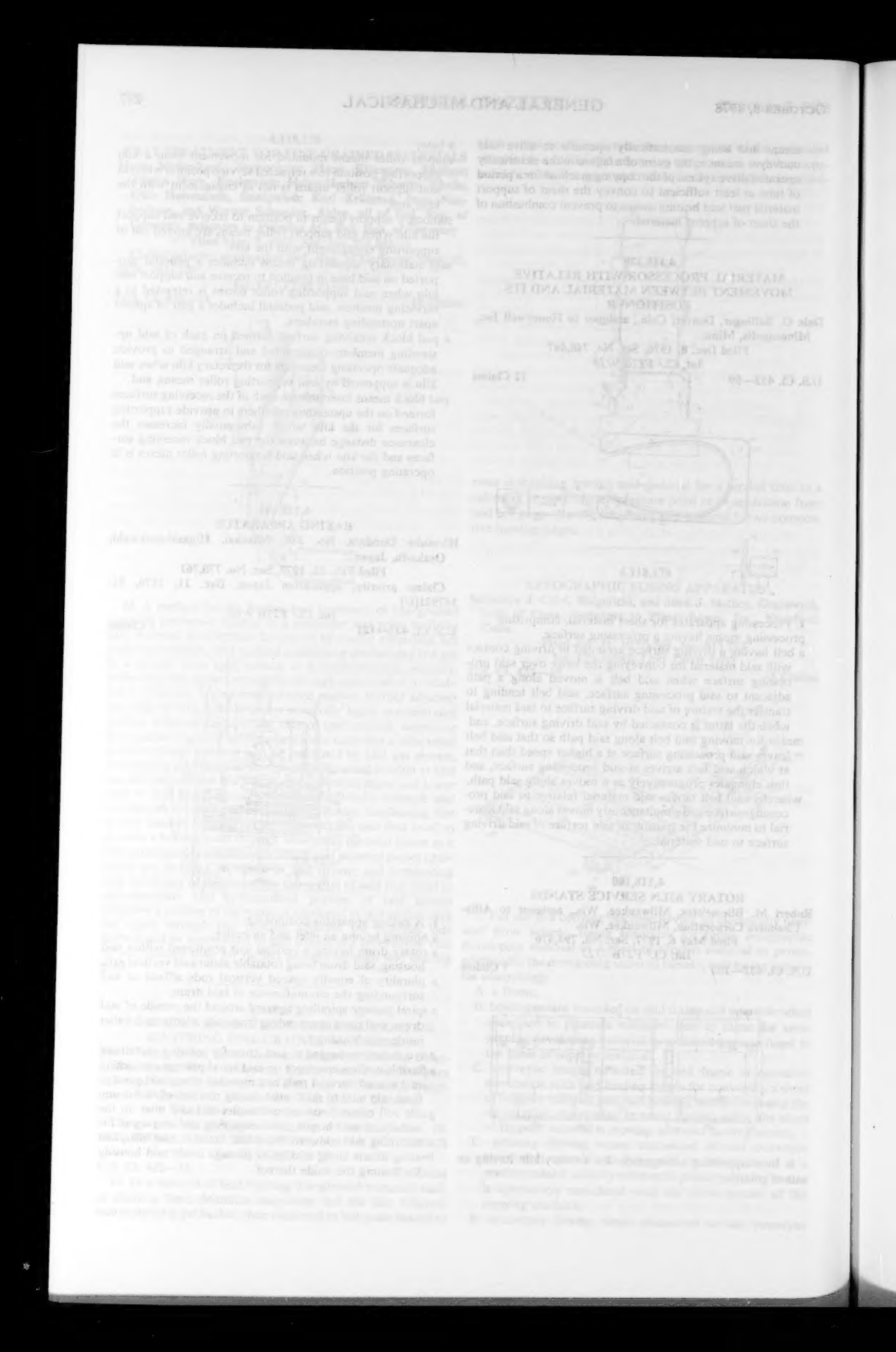
4,118,181
BAKING APPARATUS

Hirosuke Onodera, No. 340, Mizuhai, Higashi-osaka-shi, Osaka-fu, Japan

Filed Feb. 22, 1977, Ser. No. 770,761
Claims priority, application Japan, Dec. 11, 1976, 51-167921[U]
Int. Cl.[2] F27B 9/00
U.S. Cl. 432—121 **7 Claims**



1. A baking apparatus comprising:
a housing having an inlet and an outlet;
a rotary drum having a vertical axis positioned within said housing, said drum being rotatable about said vertical axis;
a plurality of equally spaced vertical rods affixed to and surrounding the circumference of said drum;
a spiral passage spiralling upward around the outside of said drum, said passage extending from said inlet to said outlet inside said housing;
drive means connected to said drum for rotating said drum;
a flexible endless conveyor on said spiral passage contacting said spaced vertical rods and movable along said passage from said inlet to said outlet during rotation of said drum;
guide roll means between said outlet and said inlet on the outside of said housing and engaging said conveyor for returning said conveyor from said outlet to said inlet; and
heating means along said spiral passage inside said housing for heating the inside thereof.



4,118,182

SOLUTIONS OF AZO DYES DERIVED FROM 4-4-DIAMINO-2,2-STILBENEDISULFONIC ACID

Sanford Byrom Smith, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 628,368, Nov. 3, 1975, abandoned, which is a division of Ser. No. 330,319, Feb. 7, 1973, abandoned. This application Aug. 24, 1977, Ser. No. 827,233

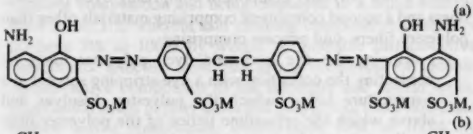
Int. Cl.[2] D06P *3/32, 3/60;* **D21H** *1/46*

U.S. Cl. 8—7 **10 Claims**

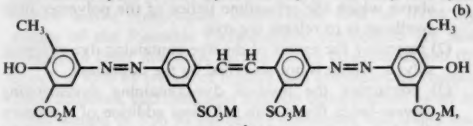
1. The aqueous dye solution consisting essentially of the following components by weight:

(i) 10% to 25% of at least one dye selected from the group

(a)

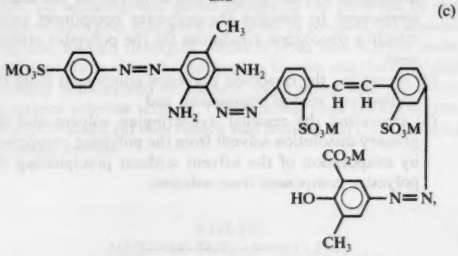


(b)



and

(c)



wherein M is a water-solubilizing cation;

(ii) 5% to 20% of urea; and

(iii) 55% to 85% of water.

4,118,183

PROCESS FOR THE TREATMENT OF WARP YARNS

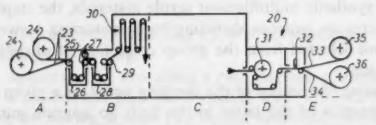
Eckhardt Godau, Hofheim, Fed. Rep. of Germany, and Max Schneider, Glarus, Switzerland, assignors to Quikoton AG, Glarus, Switzerland

Filed Mar. 31, 1977, Ser. No. 783,482

Claims priority, application Switzerland, Apr. 9, 1976, 4494/76

Int. Cl.[2] D06P *5/00, 7/00;* **D06B** *1/00*

U.S. Cl. 8—18 R **10 Claims**



1. A continuous process for the treatment of warp yarns, wherein a row of substantially parallel, unbundled warp yarns is impregnated with an excess of a treating liquor, said excess is then removed from the impregnated yarns in a liquor removal zone, the yarns are dried and finally wound up on a loom beam, the process which comprises, at least in said liquor removal zone, the linear thread density of the warp yarn row, expressed by the relation $Q = F \times D$ wherein Q is the linear thread density, F is the thread count in cm^{-1}, and D is the mean diameter of each thread in cm, is brought to a value of at least 2, said value of at least 2 defining at least two complete superimposed sheets of warp yarns, with adjacent warp yarns contacting one another and being constant over the entire width of said yarn row and being substantially the same at any width increment, and the finally dried warp yarns are wound up on at least one loom beam, said increased linear thread density of at least 2 being reduced to the nominal thread count for weaving of each loom beam before the treated warp yarns are wound up on said beam.

4,118,184

STABLE LIQUID AQUEOUS COMPOSITION OF A WATER-SOLUBLE FIBER-REACTIVE AZO DYESTUFF, CONTAINING A BUFFER SUBSTANCE, THE DYESTUFF HAVING BEEN PREPARED BY DIAZOTIZATION WITH A NITRITE AND COUPLING IN THE ABSENCE OF ACID

Konrad Opitz, Liederbach, Taunus; Josef Landler, Hofheim, Taunus, and Erhard Worfel, Hattersheim, Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 653,128, Jan. 28, 1976, abandoned. This application Jun. 17, 1977, Ser. No. 807,740

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1975, 2529657

Int. Cl.[2] D06P *1/38, 1/382, 1/384*

U.S. Cl. 8—26 **5 Claims**

1. A stable, liquid aqueous composition of fiber-reactive dye consisting essentially of 5 to 45% by weight of 1, 2, 3, or 4 dyestuffs which in the free acid form have the formula

$$(HO_3S)_m\text{-}F\text{-}Z_n$$

in which F is the chromophoric radical of a monoazo dyestuff, Z is a fiber-reactive group selected from the group consisting of vinyl sulfonyl, β-chloroethyl-sulfonyl, β-acetoxyethyl-sulfonyl, β-(3-sulfobenzoyloxy)-ethyl-sulfonyl, β-sulfatoethyl-sulfonyl, β-thiosulfatoethyl-sulfonyl, β-phosphatoethyl-sulfonyl, β-sulfatoethylsulfonyl-methylamino and vinylsulfonyl-methylamino, m is an integer of from 1 to 8 and n is an integer of from 1 to 3, water and 1, 2, 3, or 4 buffer substances selected from the group consisting of sodium acetate, potassium acetate, sodium oxalate, potassium oxalate, an acid sodium salt of phosphoric acid, and acid potassium salt of phosphoric acid, a mixture of the sodium or potassium salts of phosphoric acid and sodium borate, said composition having a pH-value of from 3 to 7 and being characterized by said dyestuff having been prepared in an aqueous, aqueous organic or organic medium by reacting a stoichiometric amount of an aromatic amine and of a coupling component, the amine or the coupling component or both having a free acid sulfo group, with a stoichiometric amount of an alkali metal nitrite and without addition of an acid.

4,118,185

PROCESS FOR DYEING AND PRINTING NICKEL-CONTAINING POLYOLEFINS

Reinhard Mohr, Offenbach am Main, and Kurt Hohmann, Neu-Isenburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

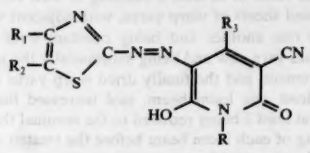
Filed Sep. 29, 1976, Ser. No. 727,649

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1975, 2544247

Int. Cl.[2] C09B *45/00;* **D06P** *3/79*

U.S. Cl. 8—42 D **13 Claims**

1. A process for the dyeing and printing of nickel-containing polyolefin fiber which comprises bringing said material into contact with a dyestuff of the formula



wherein R is hydrogen, lower alkyl, phenyl-(lower alkylene), phenyl-(lower-alkylene) substituted in the benzene nucleus by 1 to 2 substituents of the group consisting of chlorine, cyano, hydroxy, carbalkoxy having 2 to 5 carbon atoms and carboxylic acid amide, or R is phenyl or phenyl substituted by 1 or 2 substituents of the group consisting of chlorine, lower alkyl, lower alkoxy, cyano, carbonamide and sulfonamide, R_1 is hydrogen, lower alkyl, lower alkyl substituted by 1 or 2 substituents of the group consisting of carbalkoxy of 2 to 5 carbon atoms and carboxylic acid amide, or is phenyl or phenyl substituted by 1 or 2 substituents of the group consisting of chlorine, lower alkyl, lower alkoxy, cyano, carboxylic acid amide and sulfonic acid amide, R_2 is hydrogen, lower alkyl, lower alkyl substituted by 1 or 2 substituents of the group consisting of carbalkoxy having 2 to 5 carbon atoms and carboxylic acid amide, or is phenyl or phenyl substituted by 1 or 2 substituents of the group consisting of chlorine, lower alkyl, lower alkoxy, cyano, carboxylic acid amide and sulfonic acid amide, or is halogen, nitro, cyano, thiocyanate, carbalkoxy having 2 to 5 carbon atoms, alkylcarbonyl having 2 to 5 carbon atoms, carbamoyl, carbamoyl mono- or disubstituted by 1 or 2 alkyl having 1 to 4 carbon atoms or by 1 alkyl of 1 to 4 carbon atoms and one phenyl or by phenyl, and R_3 is alkyl having 1 to 4 carbon atoms.

4,118,186

PROCESS FOR THE FIXATION OF ORGANIC DYESTUFFS ON MATERIALS HAVING A FIBROUS STRUCTURE

Erich Feess, Hofheim am Taunus; Hartmut Springer, Konigstein, Taunus, and Willy Gronen, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

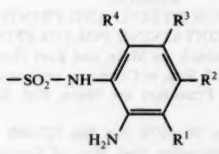
Filed May 11, 1977, Ser. No. 796,039

Claims priority, application Fed. Rep. of Germany, May 13, 1976, 2621274

Int. Cl.[2] C09B *27/00;* **C07D** *249/00;* **D06M** *13/38*

U.S. Cl. 8—49 **5 Claims**

1. A process for the fixation of an organic dyestuff on materials having a fibrous structure, which comprises applying an organic dyestuff containing one or several groups of the formula (I)



(I)

in which R^1, R^2, R^3 and R^4 each represent a non-ionic, anionic or cationic substituent, with the exception of a primary or secondary amino group or the salts thereof, in dissolved form onto said materials and subsequently subjecting it to the action of nitrous acid.

4,118,187

FABRIC DYE STRIPPING, SEPARATION AND RECOVERY OF POLYESTER

Norman C. Sidebotham, Gulf Breeze; Paul D. Shoemaker, and Clarence W. Young, III, both of Pensacola, all of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 578,592, May 19, 1975, Pat. No. 4,003,880. This application Dec. 9, 1976, Ser. No. 749,149

The portion of the term of this patent subsequent to Jan. 18, 1994, has been disclaimed.

Int. Cl.[2] D06L *3/14;* **C08G** *63/76;* **C08J** *3/08*

U.S. Cl. 8—102 **22 Claims**

1. A process for separation, recovery and reuse in production, of polyester polymer from a collection of materials comprising a first polyester component comprising dyed polyester fibers and a second component comprising materials other than polyester fibers, said process comprising:

(1) stripping the dye from said dyed polyester fibers by contacting the collection with a dye-stripping solvent at a temperature below which the polyester dissolves and above which the crystalline lattice of the polyester fiber swells so as to release the dye;

(2) removing the excess of the dye-containing dye-stripping solvent which is not absorbed by the collection;

(3) contacting the residual dye-containing dye-stripping solvent-laden fibers with sufficient addition of a primary dissolution solvent which is not a solvent for the second component to dissolve the polyester component under selective dissolution conditions for the polyester component;

(4) separating the dissolved polyester component from the undissolved second component; and

(5) separating the residual dye-stripping solvent and the primary dissolution solvent from the polyester component by evaporation of the solvent without precipitating the polyester component from solution.

4,118,188

PROCESS FOR IMPROVING THE BULKINESS OR TEXTURATION OF SYNTHETIC MULTIFILAMENT TEXTILE MATERIALS

Hans-Ole Larsen, Hvidovre, Denmark, assignor to Ultrasona AG, Zurich, Switzerland

Continuation of Ser. No. 488,227, Jul. 12, 1974, abandoned, which is a continuation of Ser. No. 134,072, Apr. 14, 1971, abandoned. This application Mar. 29, 1976, Ser. No. 671,108

Claims priority, application United Kingdom, Apr. 14, 1970, 17786/70

Int. Cl.[2] D06M *1/14, 5/18*

U.S. Cl. 8—130.1 **6 Claims**

1. In a process for improving the bulkiness or texturation or both of synthetic multifilament textile materials, the steps of:

preparing an aqueous shrinking bath containing a swelling agent selected from the group consisting of phenol and cresols,

increasing the ability of the swelling agent, at a given concentration of the latter in the bath, to migrate into the internal structure of the individual fibers of a textile material by reducing the solubility of the swelling agent in the bath by incorporating into the latter a solubility reducing quantity of a water-soluble driving-off agent selected from the group consisting of NaCl, Na_2SO_4, $Al_2(SO_4)_3$, NaH_2PO_4, NH_4Cl, $(NH_4)_2CO_3$, $HCOONH_4$ and $(NH_4)_2HPO_4$, the concentration of said driving-off agent being at least 10% by weight based on the weight of said bath, and

introducing the synthetic multifilament textile material into the shrinking bath for a period of less than one minute.

4,118,189
METHOD OF WASHING TEXTILES

Elmar Reinwald, Dusseldorf-Holthausen, and Milan Johann Schwuger, Haan, both of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

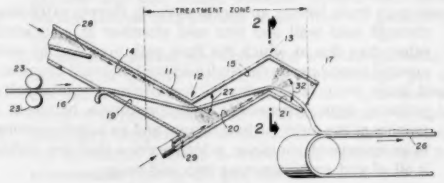
Filed Jun. 29, 1976, Ser. No. 700,864
Claims priority, application Austria, Jul. 2, 1975, 5088/75
Int. Cl.[2] B08B *3/00*
U.S. Cl. 8—137 10 Claims

1. A method for the washing of textiles comprising (1) contacting soiled textiles with a foamed detergent solution, said detergent solution being maintained at a temperature of from 30° C. to 70° C. and containing from 10 to 50 gm per liter of a cleaning composition and being employed in a liquor ratio of from 1:1 to 1:5, wherein said cleaning composition comprises (a) from 5% to 100% by weight of foamable surface-active compounds selected from the group consisting of anionic surface-active compounds of the sulfonate and sulfate types, alkali metal soaps of fatty acids and polyglycol ether non-ionic surface active compounds, where from 50% to 100% by weight of the foamable surface-active compounds are said polyglycol ether non-ionic surface-active compounds and (b) from 0 to 95% by weight of builder salts and cleansing composition additives, said detergent solution being foamed by air to a liter weight of 5 to 30 gm before contacting said soiled textiles, (2) agitating said soiled textiles in the presence of said foamed detergent solution for at least 30 seconds, (3) separating said foamed detergent solution from said textiles under sufficient force whereby the foam is broken and the detergent solution is recovered as a liquor, (4) foaming said recovered detergent solution with air, (5) repeating steps (1) to (4) from five to 50 times, (6) then rinsing said textiles, and (7) recovering cleansed textiles.

4,118,190
METHOD FOR ANNEALING ACRYLONITRILE-CONTAINING FILAMENTS

Thomas M. Veazey, Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 3, 1977, Ser. No. 821,264
Int. Cl.[2] D06B *5/06*
U.S. Cl. 8—149.3 7 Claims



1. The method of annealing a tow of acrylonitrile-containing filaments, comprising:

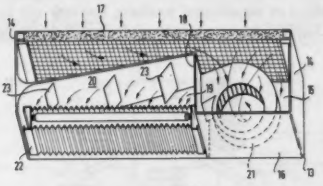
a. advancing the tow along a path through a housing under a tension less than the shrinking tension of the tow, said path having at least two bends, said bends having inside and outside corners and being in opposite directions to each other, and

b. passing a heated annealing fluid along the walls of the housing leading to the inside corners of the bends, said fluid having a velocity such that said fluid clings in a layer to the walls of the housing to said inside corners, the angles of the bends of said inside corners being sufficiently great that said fluid separates from said walls and passes through the tow for moving the tow out of contact with said inside corners and forwarding the tow along the path.

4,118,191
GAS STERILIZATION APPARATUS

Franz Böhnensieker, Vom-Stein-Strasse 22, D-4834 Harsewinkel, Germany

Filed Apr. 22, 1977, Ser. No. 790,102
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1976, 2618127
Int. Cl.[2] A61L *3/00, 9/00;* F24F *3/16*
U.S. Cl. 55—279 6 Claims

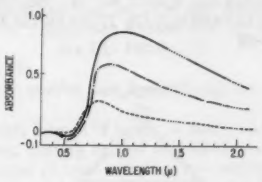


1. An apparatus for carrying out the sterilization of gaseous media in which germs, bacteria and the like are contained, which comprises a housing, said housing holding therewithin (a) at least one layer of a filter-like material selected from the group consisting of quartz wool, quartz paper and sintered quartz dust, said material being non-absorbent of UV-radiation, whereby any incident UV-radiation passes substantially through said material, the said layer having such a labyrinth-like structure that the passage of germs through the layer is not substantially prevented, but is only substantially delayed, (b) at least one UV-emitter arranged to impinge UV-radiation upon the layer, and (c) a pressure blower for forcing through the layer the medium to be sterilized.

4,118,192
METHOD AND APPARATUS FOR THE MEASUREMENT OF ANTIGENS AND ANTIBODIES

Masanobu Sawai, Yamato; Tadamitsu Sudo, Sagamihara, and Shogo Enomoto, Tokorozawa, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Aug. 16, 1977, Ser. No. 825,160
Claims priority, application Japan, Aug. 16, 1976, 51-97158
Int. Cl.[2] G01N *21/24, 33/16*
U.S. Cl. 424—12 33 Claims

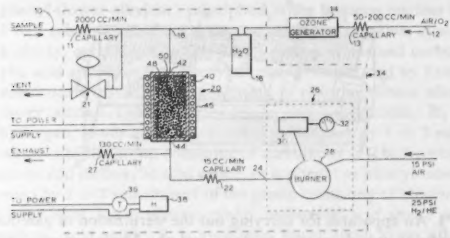


1. An absorbance method of measuring antigens and antibodies comprising supporting an antibody or an antigen on insoluble carrier particles with an average diameter of not greater than 1.6 microns to sensitize the insoluble carrier particles, reacting the supported antibody and/or antigen with a corresponding antigen or antibody or a mixture thereof in a liquid medium, irradiating the reaction mixture with light having a wavelength in the range of 0.6 to 2.4 microns and longer than the average diameter of said carrier particles by a factor of at least 1.5 and measuring the absorbance of the reaction mixture.

4,118,193
CATALYTIC REACTOR SYSTEMS METHOD AND APPARATUS

Radhakrishna Murty Neti, Brea, and Kenneth Bruno Sawa, Yorba Linda, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 29, 1977, Ser. No. 820,481
Int. Cl.[2] G01N *31/12*
U.S. Cl. 422—94 **2 Claims**



1. An improved methane analyzer comprising:

(a) a source of ozone;

(b) mixing means for mixing a sample containing methane and other hydrocarbons with ozone, said mixing means having a pair of inlets and an outlet, one of said inlets adapted to receive a sample to be analyzed, the other of said pair of inlets being connected to said source of ozone;

(c) a catalytic reactor for removing hydrocarbons other than methane and having an inlet and an outlet, said inlet being connected to said outlet of said mixing means;

(d) means for humidifying connected to cause water vapor to be included in the sample/ozone mixture input to said reactor;

(e) means for detecting and displaying the quantity of methane in a sample having an inlet and an outlet, said inlet being connected to said outlet of said reactor to receive humidified, ozonized and reacted sample therefrom;

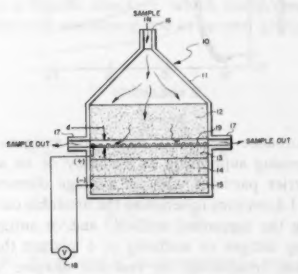
(f) an enclosure having at least said mixing means, said humidifying means, and said reactor disposed therein; and,

(g) heating means for maintaining said enclosure at an internal temperature of 70° to 75° C.

4,118,194
SENSOR FOR FLUID COMPONENTS

Douglas O. Raleigh, Encino, and Leo E. Topol, Canoga Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 8, 1977, Ser. No. 785,988
Int. Cl.[2] G01N *27/26, 27/40;* H01M *4/00*
U.S. Cl. 422—98 **11 Claims**



1. A device for sensing at least one component of a fluid substance comprising:

(a) first means including a composition reactive with at least one component of said fluid to liberate elemental chlorine, bromine, fluorine or iodine upon exposure to said component;

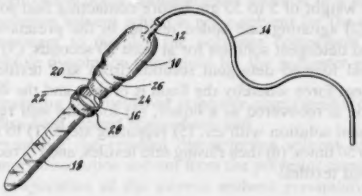
(b) a porous matrix electrode comprising a particulate layer of vitreous carbon having a median particle size of less than about 500 microns and in cooperative relation to said first means forming a first electrode through which said liberated chlorine, bromine, fluorine or iodine passes; and

(c) a solid electrolyte cell with a voltage measuring means across its electrodes including said porous matrix electrode, said measuring means operatively associated with said matrix and responsive to said liberated chlorine, bromine, fluorine or iodine for measuring a voltage which is indicative of the concentration of said chlorine, bromine, fluorine or iodine, said concentration being a known fraction or multiple of the concentration of said component in said fluid.

4,118,195
MEDICAL APPARATUS FOR TRANSPORTING FLUIDS

Janet Beach, P.O. Box 904, Camden, Me. 04843

Filed Jul. 30, 1976, Ser. No. 710,129
Int. Cl.[2] G01N *1/14*
U.S. Cl. 222—215 **9 Claims**



1. A device for moving fluids and fluidizable materials from one location to another comprising

a main body portion having an internal chamber described by a surrounding wall made from resilient material which is collapsible by the application of pressure from the exterior thereof so as to cause the volume of said chamber to decrease, and is normally biased against being collapsed,

conduit means communicating with said chamber and providing a continuous, valveless flow path thereto from outside of said main body,

said main body having an access opening therein extending through said wall and into said chamber at a location other than that at which the flow path provided by said conduit means passes through said wall into said chamber,

said main body being adapted for attaining substantially pressure tight removeable interconnection between a portion of the outer surface thereof and an access opening in an associated container, which portion includes within it all of said access opening into said body.

4,118,196
APPARATUS FOR CALCINING WET POWDERY GYPSUM

Yoshiharu Fukuda; Kazumasa Ohtani, both of Tokyo; Tossio R. Onissi, Koshigaya, and Akitoshi Takeuchi, Funabashi, all of Japan, assignors to Onoda Cement Company, Limited, Japan

Filed Jun. 13, 1973, Ser. No. 369,570
Int. Cl.[2] B01J *6/00;* F27B *15/00*
U.S. Cl. 422—232 **3 Claims**

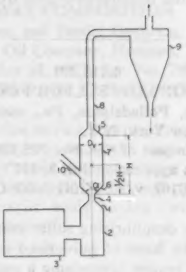
1. An apparatus for calcining wet powdery gypsum having a moisture content of about 5 to about 30% which comprises:

(a) a furnace which generates a hot gas having a temperature higher than about 900° C;

(b) a straight cylindrical hot gas supply pipe connected with the gas outlet of said furnace and having a tapered upper portion;

(c) a straight cylindrical high stream velocity pipe connected with the tapered portion of said hot gas supply pipe and dimensioned to develop a gas velocity in said high stream velocity pipe within the range of from about 60 m/sec to about 150 m/sec;

(d) a substantially vertical vortex chamber connected with the upper part of said high stream velocity pipe and which chamber has a diameter at a middle cylindrical portion greater than that of said high stream velocity pipe and a maximum diameter determined so that the gas velocity at the portion of maximum diameter is within the range of from about 10 m/sec to 30 m/sec when no gypsum is supplied thereto, and which has conically tapered portions both at the top and bottom of said cylindrical portion, the bottom tapered portion converging downwardly toward and connected with the upper part of said high stream velocity pipe and having an angle of convergence within the range of about 50° to 150°, the top tapered portion comprising the vortex chamber gas outlet, and the length of said vortex chamber being more than 1.2 times longer than said maximum diameter;



(e) a wet powdery gypsum supply pipe connected with the side wall of said vortex chamber, said gypsum supply pipe being connected in such a way that a projected extension of the lower edge of said gypsum supply pipe, following the same angle as that pipe, would intersect the center axis of said vortex chamber at a point higher than the bottom of said vortex chamber and lower than one half the distance from the bottom to the top of said vortex chamber, and said gypsum supply pipe being oriented to introduce gypsum into said vortex chamber toward said bottom portion thereof and counter to the flow of gases therethrough;

(f) a heat transmission pipe connected with the gas outlet of said vortex chamber for flowing therethrough gas and calcinated gypsum with sufficiently low heat loss, and being of sufficient length, to effect substantially complete secondary dehydration of the calcinated gypsum while the calcinated gypsum is transported through the heat transmission pipe by the gas; and

(g) a gypsum collector connected with said heat transmission pipe.

4,118,197

CARTRIDGE AND FURNACE FOR CRYSTAL GROWTH

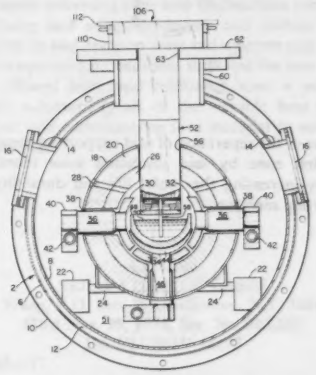
Brian H. Mackintosh, West Roxbury, and David N. Jewett, Harvard, both of Mass., assignors to Mobil Tyco Solar Energy Corp., Waltham, Mass.

Filed Jan. 24, 1977, Ser. No. 761,941
Int. Cl.² B01J *17/18*
U.S. Cl. 422—246 **28 Claims**

1. Apparatus for growing a silicon ribbon-type crystal from a melt comprising:

a furnace having (1) a chamber with a top aperture leading to the interior of said chamber, (2) means within said chamber for supporting therein a crucible containing a melt from which a crystal is to be grown so that the melt in the crucible will be in line with the aperture, and (3) means for heating a crucible supported within said chamber by said supporting means; and

at least one cartridge which is arranged to be moved into and out of said furnace through said top aperture, said cartridge being a unitary assembly comprising (1) a capillary die adapted to be used to provide a growth pool of melt from which a crystal can be pulled, (2) solid vertically elongate heat-conducting means disposed above said die and arranged so as to extend on opposite sides of and control the thermal gradient lengthwise in a ribbon-type crystal which is pulled from said growth pool of melt and



(3) means holding said heat-conducting means in a fixed relation to said die;

means for moving the cartridge vertically into and out of said chamber via said aperture and for positioning the cartridge within said chamber so as to place said die in communicating relation with a melt contained by said crucible, said means for moving the cartridge including guide means for guiding said cartridge during its vertical movement into and out of said chamber; and

a pulling mechanism disposed above the furnace for pulling a crystal from said growth pool of melt past said heat-conducting means and out of said furnace via said aperture.

4,118,198

CATALYTIC PURIFIER UNIT

Per G. Norback, Lidingo, Sweden, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Division of Ser. No. 481,211, Jun. 20, 1974, Pat. No. 3,951,865.
This application Jan. 21, 1976, Ser. No. 651,059
Claims priority, application Sweden, Jun. 25, 1973, 7308909
Int. Cl.² F01N *3/15*
U.S. Cl. 422—173 **7 Claims**

1. A catalytic purifier unit for purifying hot exhaust gases comprising:

a skeletal body formed of layers, at least some of which are corrugated, bearing against one another and defining a large number of open-ended narrow axially aligned passageways through which the exhaust gases flow from one end to the other thereof,

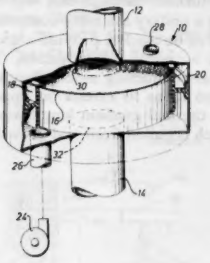
a casing for enclosing said body,

said body comprising a first centrally located catalytically treated zone and a second insulating zone surrounding said first zone,

said casing having inlet means and outlet means in axial alignment and communicating with at least a portion of the passageways of said catalytically treated zone for directing the hot gases through said catalytically treated zone,

said second zone having elastic means of organic material resiliently supporting said body.

said insulating zone being effective for maintaining said organic supporting member at a lower temperature than the temperature of the first catalytically treated zone



because of the separation of said supporting member from said first zone by said insulating zone therebetween, thereby increasing the useful life and durability of said supporting member.

4,118,199

MONOLITHIC CARRIER CATALYST AND ARRANGEMENTS OF SUCH A CATALYST FOR THE PURIFICATION OF EXHAUST GASES FROM AN INTERNAL COMBUSTION ENGINE

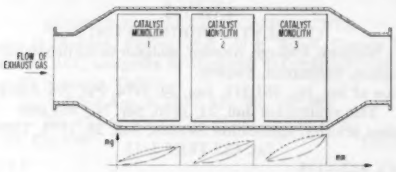
Herbert Völker, Hanau; Edgar Koberstein, Alzenau, and Jörg Hensel, Hanau, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Sep. 17, 1976, Ser. No. 724,428

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1975, 2542282; Dec. 3, 1975, 2554359

Int. Cl.[2] B01J *8/00;* **F01N** *3/15*

U.S. Cl. 422—171 **9 Claims**



1. In a monolithic carrier catalyst containing a catalytically active substance for the purification of a stream of exhaust gases from an internal combustion engine whereby said stream flows through said monolith, said monolith carrier being contained in a container for said carrier, said exhaust gases being directed by said container to flow through said monolith carrier in one direction and in the desired orientation with regard to the carrier, the improvement which comprises having the catalytically active component deposited on said monolith carrier in a manner to create a positive gradient of the catalytically active substance with respect to the carrier and increasing in the direction of the flow of exhaust gases through said monolith carrier and being about 6×10^{-4} to about 3×10^{-2}% per mm, expressed as the increase in weight percent of catalytically active substance per unit of length of said carrier over the entire length of said carrier.

4,118,200

PROCESS FOR DESULFURIZING COAL

Paul R. Kruesi, Golden, Colo., assignor to Cato Research Corporation, Wheatridge, Colo.

Filed Jul. 8, 1977, Ser. No. 813,801

Int. Cl.[2] C10L *9/10;* **C10B** *57/00*

U.S. Cl. 44—1 R **15 Claims**

1. A process for desulfurizing coal which comprises:

(a) forming a liquid fused salt bath melting below the decomposition temperature of coal comprised of chlorides selected from the group consisting of chlorides of alkali metals, alkaline earth metals, ammonia, ferric iron, and zinc;

(b) introducing the coal into said liquid fused salt bath;

(c) introducing into said fused salt bath chlorine from a source selected from the group consisting of elemental chlorine, and a chlorine donor selected from the group consisting of sulfur chloride, ferric chloride and cupric chloride to react the sulfur-containing components of the coal with chlorine to form elemental sulfur and chlorides; and

(d) recovering the desulfurized coal from the liquid fused salt bath.

4,118,201

PRODUCTION OF LOW SULFUR FUELS FROM COAL

Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 705,198, Jul. 14, 1976, abandoned. This application Jul. 8, 1977, Ser. No. 813,914

Int. Cl.[2] C10L *9/10;* **C10G** *1/00;* **C10B** *57/00*

U.S. Cl. 44—1 R **5 Claims**

1. A process for desulfurizing sulfur-containing solid carbonaceous fuel in the form of pulverized coal in a multi-stage fluidized reaction system comprising a gas generating zone, a desulfurization zone and a gas-solids separating zone, the generating and desulfurization zones having operating conditions dependent upon one another, to produce a maximum amount of solid, low-sulfur carbonaceous fuel which is useful as a direct supply of fuel for power plants or industrial boilers which utilize low B.T.U. fuel comprising the steps:

(a) reacting an oxygen-containing gas, steam, and auxiliary carbonaceous fuel in a fluidized state at a temperature of 1800° to 3000° F. in a gas generating zone to form synthesis gas comprising hydrogen and carbon monoxide;

(b) continuously passing heated synthesis gas upwardly into a desulfurization zone and introducing into said zone fresh pulverized coal solids;

(c) maintaining the coal solids in said zone in a fluidized state at a temperature in the range of 1100° F. to 1700° F. under a pressure of about 100 to 1000 psig for a period of time sufficient to form hydrogen sulfide and thereby reduce the sulfur content of the coal to below about 1 percent by weight, and

(d) disengaging sulfur-containing gases from the desulfurization zone and recovering a solid fuel product of reduced sulfur content.

4,118,202

PRE-PRIMED FUEL AND METHOD AND APPARATUS FOR ITS MANUFACTURE

Addison B. Scholes, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Filed Oct. 17, 1977, Ser. No. 842,731

Int. Cl.[2] C10L *9/00, 5/22*

U.S. Cl. 44—6 **22 Claims**

12. Apparatus to coat fuel with a normally non-fluid primer comprising

a structure forming a deposition chamber in its interior having entrance and exit openings and forming on its exterior stations for loading the apparatus with fuel to be coated and for unloading coated fuel, said deposition

chamber including a container at its lower portion for liquefied primer;

an unobstructing conveyor supported by said structure so that the conveyor can be driven through the loading station, the deposition chamber, the unloading station, and the container;

a heater in the lower container portion of the structure to liquefy and maintain the primer in a liquid state;

means to break the liquefied primer into particles and a system to deliver the liquefied primer from the lower container portion of the structure to said means; and

means within the structure to deposit the primer spray on the charred wood from above and below the conveyor.

19. Pre-primed charred wood comprising a piece of broken wood which has been charred and is several inches in length, and on the order of an inch or less in those dimensions transverse to its length, having applied to its exterior a non-fluid combustible primer material by the steps of electrostatically charging and depositing particles of the non-fluid primer.

4,118,203
WAX COMPOSITION

James W. Beardmore, and Daniel Goehring, both of Houston, assignors to Shell Oil Company, Houston, Tex.

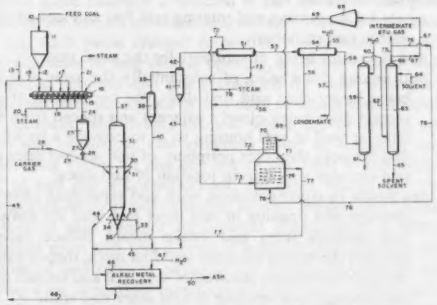
Filed May 18, 1977, Ser. No. 798,229
Int. Cl.[2] C08L *91/08;* **C10L** *5/00;* **C11C** *5/00*
U.S. Cl. 44—7.5 **19 Claims**

1. A wax composition having improved mold release properties comprising candle wax and from about 0.01 to about 10 percent by weight of mold release additive selected from the group consisting of dimethyl, diethyl and methyl-ethyl esters of aliphatic dicarboxylic acids having two to four carbon atoms and mixtures thereof.

4,118,204
PROCESS FOR THE PRODUCTION OF AN INTERMEDIATE BTU GAS

James M. Eakman, Houston, Tex.; Nicholas C. Nahas, Morris Plains, N.J., and Charles A. Euker, Jr., Houston, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 25, 1977, Ser. No. 771,504
Int. Cl.[2] C01J *3/54*
U.S. Cl. 48—197 R **13 Claims**



1. A process for the production of an intermediate Btu gas from a carbonaceous feed material and steam which comprises:

(a) reacting said steam with said carbonaceous feed material in a reaction zone at a reaction temperature between about 1000° F. and about 1500° F. and at a reaction pressure in excess of about 100 psia, in the presence of a carbon-alkali metal catalyst and sufficient added hydrogen and carbon monoxide to provide substantially equilibrium quantities of hydrogen and carbon monoxide in said reaction zone at said reaction temperature and said reaction pressure;

(b) withdrawing from said reaction zone a raw product gas containing substantially equilibrium quantities, at said reaction temperature and pressure of methane, carbon dioxide, steam, hydrogen and carbon monoxide;

(c) treating said raw product gas for the removal of acid gases;

(d) recovering a portion of the treated gas as said intermediate Btu product gas;

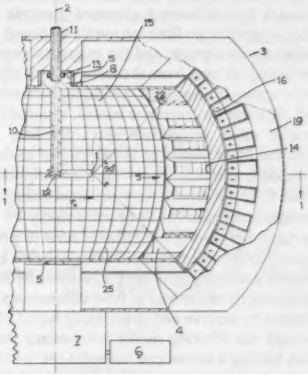
(e) contacting the remainder of said treated gas with steam in a steam reforming zone under conditions such that the methane in said treated gas reacts with said steam to produce additional hydrogen and carbon monoxide; and

(f) passing the effluent containing hydrogen, carbon monoxide and unreacted steam without substantial cooling from said steam reforming zone into said reaction zone, thereby supplying said added hydrogen and carbon monoxide required in said reaction zone and wherein said reforming zone is operated at conditions such that the heat content of said effluent from said reforming zone is sufficient to supply substantially all of the sensible heat needed to preheat said carbonaceous feed material to said reaction temperature.

4,118,205
SEPARATION OF GASES

Chia-Gee Wang, P.O. Box 211, Millwood, N.Y. 10546

Filed Nov. 29, 1976, Ser. No. 745,565
Int. Cl.[2] B01D *45/12*
U.S. Cl. 55—17 **9 Claims**



1. A process for separating gaseous mixtures of molecules of different mass comprising the steps of:

causing a rotating means to eject a contiguous plurality of successive groups of molecules into an evacuated space to form a continuous stream of said mixture;

allowing the molecules of each said group of molecules to move in accordance with their thermal velocities for a predetermined period of time following ejection, thereby to allow each said group of molecules to form a generally spherical configuration the leading portion of which will be enriched, in molecules of lighter mass, relative to lesser radii,

using a deflector means co-rotating with said rotating means to deflect molecules, which have been allowed to move for said predetermined period of time in accordance with their thermal velocities, from at least one desired portion of said stream, and

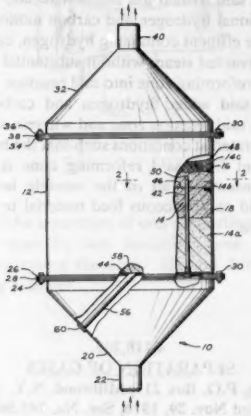
using a stationary collector means to collect said deflected molecules.

4,118,206

OIL MIST FILTERING APPARATUS AND METHOD

Willem Jacob Hagendoorn, Louisville, Ky., assignor to Fisher-Klosterman, Inc., Louisville, Ky.

Continuation of Ser. No. 506,442, Sep. 16, 1974, abandoned. This application Dec. 7, 1976, Ser. No. 748,322
Int. Cl.[2] B01D *23/16, 53/04*
U.S. Cl. 55—74 7 Claims



1. A filtering device for a turbine crankcase comprising a hollow casing having a lower-end entrance means for receiving gaseous effluent flow from the crankcase, an upper end exhaust means for delivering cleansed gaseous flow to the atmosphere, a particulate filtering media disposed in the casing between the entrance means and the exhaust means for separating and retaining oil mist from the flow, a floor plate extending transversely across the inside of the casing beneath the filtering media and adjacent the entrance means, a plurality of spaced-apart parallel tubes projecting upwardly into the filtering media from the floor plate, the lower end of each of the tubes being in sealed communication with a corresponding opening through the floor plate whereby the imcoming effluent flow will move upwardly past the floor plate solely by means of the tubes, the tubes permitting the effluent flow to progress therethrough and into the filtering media, drain means comprising at least a conduit extending generally downwardly from the floor plate and having its upper end in flow communication with the filtering media to receive and drain away liquid oil gravitating down through the filtering media and toward the floor plate, the conduit having a lower end extending to a drain discharge opening outside the casing such that liquid oil drained from the filtering media does not intermix with the incoming effluent flow from the crankcase.

5. A method of filtering oil particles from the vaporous flow emitted by a turbine crankcase comprising steps of:

establishing a filtering bed of vertically successive layers of packed particulate solids,

providing flow entrance means for directing the emitted vaporous flow generally upwardly through the bed,

providing dispersal means for generally dispersing the flow whereby oil particles from the flow will coalesce throughout the bed,

providing gravity flow means for draining collected oil away from the bed, including conduit means separate from the flow entrance means and dispersing means whereby intermixing of the emitted vaporous flow with collected oil is avoided,

providing means at a point above the bed for exhausting the cleansed vaporous flow away from the bed and to the ambient atmosphere,

utilizing a plurality of flow tubes disposed generally parallel in a spaced-apart relation in the bed to disperse the vaporous flow throughout the bed, and

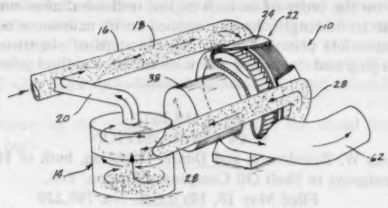
constructing the tubes from tubular material having microporous walls to provide improved flow dispersion throughout the bed.

4,118,207

ROTATING DISC PARTICULATE SEPARATOR

Thomas K. Wilhelm, Cedar Falls, Iowa, assignor to United States Steel Corporation, Pittsburg, Pa.

Filed Dec. 6, 1976, Ser. No. 747,879
Int. Cl.[2] B01D *45/00*
U.S. Cl. 55—338 5 Claims



1. A separator for separating particulate material from fluid or gas systems comprising,

intake means adapted to be in communication with a medium in which a particular material is suspended;

a separating chamber having a housing including a circular sidewall and an inner end wall, said housing having an intake opening in communication with said intake means and a discharge opening;

said inner end wall having an opening therein providing communication between the interior and exterior of said chamber;

a plurality of first discs and at least two second discs axially aligned in close spaced relationship within said separating chamber;

said second discs being located between said first disc and said inner end wall and in close spaced relationship to said inner end wall;

said first and second discs having hollow portions adjacent the centers thereof;

means for supporting and rotating said first and second discs within said chamber;

said first discs being of substantially the same size;

said second discs being of substantially the same size and being larger than said first discs, the peripheries of said second discs being closely adjacent and spaced from said circular wall of said housing so as to provide a backflush seal between the outer periphery of said second discs and said circular wall during rotation of said discs;

fan means in communication with said separating chamber through said opening in said inner end wall for drawing said medium from said intake means thence radially through the spaces between said first discs, thence axially through the hollow portions of said first and second discs and through said opening in said inner end wall,

whereupon rotation of said first and second discs causes a radially inward pressure flow in the spaces between said first discs and a radially outward pressure flow in the spaces between said second discs, the rotation of said first and second discs causing the particulate material in said medium to move adjacent the peripheries of said first and second discs; and

particulate collector means in communication with said separating chamber through said discharge opening adjacent the peripheries of said first and second discs and adapted to receive a portion of the medium therein along with particulate materials suspended in said separator

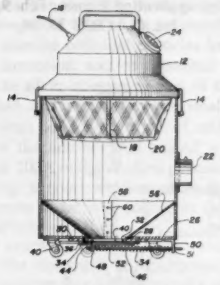
chamber adjacent the peripheries of said first and second discs.

4,118,208

DISCHARGE MEANS FOR CANISTER VACUUM CLEANER

George Lewis Klinedinst, 964 N. George St., York, Pa. 17404

Filed Apr. 25, 1977, Ser. No. 790,542
Int. Cl.[2] B01D *35/16*
U.S. Cl. 55—433 3 Claims



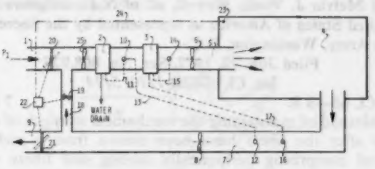
1. Discharge means for use with a canister type vacuum cleaner having a canister which detachably supports a suction head at the upper end thereof and having a bottom at the lower end of said canister in which a circular opening is formed, said discharge means comprising in combination, a mounting plate having a central circular opening similar in size to said opening in the bottom of said canister and positioned coaxially therewith, means adapted to secure said plate firmly to the lower surface of said bottom with said openings in registry, a pair of parallel guide channels connected to the surface of said plate opposite the surface mounted against said bottom of said canister and each guide channel respectively positioned adjacent opposite sides of said central opening, a cut-off closure slide supported between said guide channels for close sliding engagement with the surface of said plate to which said channels are connected and having one end which moves toward and from said opening in said mounting plate, an actuating rod, connecting means on said one end of said slide to which one end of said rod is connected and the other end of said rod comprising an outer end extending beyond the periphery of the bottom of said canister for manual engagement, a spring mounted upon said rod, a bracket adapted to be fixed to said bottom of said canister adjacent the outer edge thereof and having a leg depending therefrom and provided with an aperture through which the outer end of said actuating rod extends, said spring on said rod extending between said leg and said connecting means on said one end of said slide and operable to move said slide from open to closing position over said opening in said plate, and the edge of said slide which moves toward and from said opening in said plate being in the form of a concave arc similar to a segment of the circumference of the circular opening in said mounting plate and said arcuate edge of said slide being bevelled to constitute a sharpened shearing edge cooperable with the perimeter of said central opening in said plate to remove any accumulated material extending through said opening.

4,118,209

CLIMATE-CONTROL UNIT PARTICULARLY FOR INCORPORATION IN A CONTAINER

Petrus André Theodorus Exler, Zoetermeer, and Johannes Lobbe, Krimpen A/D IJssel, both of Netherlands, assignors to Pakhoed-Rotterdam B.V., Rotterdam, Netherlands

Filed Jul. 19, 1976, Ser. No. 706,603
Claims priority, application Netherlands, Jul. 18, 1975, 7508644
Int. Cl.[2] F25D *17/08*
U.S. Cl. 62—176 D 12 Claims



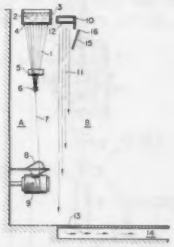
1. A climate-control unit particularly for incorporation in a container for transporting perishable goods, for example, agricultural produce and other edible commodities or moisture-sensitive goods such as steel products, electronic apparatus and the like, comprising a device for controlling air contained in the loading space and/or fresh air to be introduced therein within predeterminable temperature and humidity limits, and means for uniformly conveying air in and out of the useful loading space; said means comprising a fresh air inlet, an air outlet, and a return duct communicating said inlet and said outlet, blower means in said inlet downstream of the connection of said return duct with said air inlet, and a valve in each said inlet, said outlet and said return duct; said valves being controlled by a wet-bulb thermostat to be mounted in the loading space.

4,118,210

METHOD AND APPARATUS FOR MANUFACTURING GLASS FIBERS USING DEFLECTABLE AIR CURTAIN

Takeshi Watanabe; Kazuo Nishimaki; Kazuo Shimanuki; Katuo Mita, and Satoru Konno, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Aug. 29, 1977, Ser. No. 828,690
Claims priority, application Japan, Aug. 31, 1976, 51-103901
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—2 7 Claims



1. In a method for draw forming glass filaments wherein molten glass flows through holes in an orifice plate on the bottom of an elevated melt furnace to form a plurality of individual filaments which are collected and drawn downwardly by winding means, and wherein a heat shielding air curtain is established between an air flow supply duct adjacent the furnace and a floor exhaust duct to protect the operator, the improvements comprising the steps of: deflecting the air flow

from said supply duct across the bottom of the orifice plate at least during the initial start-up period of the filament forming operation, to thereby cool the molten glass cones formed at the orifice plate hole exits and increase their viscosity to prevent adjacent cones and filaments from converging together, and forming said heat shielding air curtain from said air flow when forming and winding conditions are stabilized.

4,118,211

METHOD OF MAINTAINING THE STRENGTH OF OPTICAL FIBERS

Thomas R. Au Coin, Ocean; Sam Di Vita, West Long Branch, and Melvin J. Wade, Howell, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 22, 1977, Ser. No. 808,927

Int. Cl.[2] G02B *1/10, 5/14*

U.S. Cl. 65—3 R **7 Claims**

1. Method of maintaining the mechanical strength of optical fibers after the fibers have been drawn from a melt, said method comprising hermetically sealing said fibers with a coating of silicon nitride that is impervious to both moisture and chemically corrosive environments immediately after the optical fiber has been drawn from the melt.

2. Method of maintaining the mechanical strength of optical fibers after the fibers have been drawn from a melt, said method comprising hermetically sealing said fibers with a coating of boron nitride that is impervious to both moisture and chemically corrosive environments immediately after the optical fiber has been drawn from the melt.

3. Method of maintaining the mechanical strength of optical fibers after the fibers have been drawn from a melt, said method comprising hermetically sealing said fibers with a coating of titanium dioxide that is impervious to both moisture and chemically corrosive environments immediately after the optical fiber has been drawn from the melt.

4,118,212

DOUBLE CRUCIBLE SYSTEM FOR THE PRODUCTION OF LIGHT CONDUCTING FIBERS

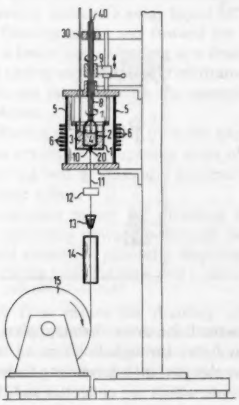
Hubert Aulich, Munich, and Josef Grabmaier, Kempfenhausen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 17, 1977, Ser. No. 852,236

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654308

Int. Cl.[2] C03B *37/02*

U.S. Cl. 65—3 A **19 Claims**



1. A double crucible system having two concentric melting crucibles for the production of a light conducting fiber, comprising: an inner crucible means for accommodating a melt for a core of the light conducting fiber, an outer crucible means surrounding the inner crucible means for accommodating a melt for a casing of the light conducting fiber, the inner and outer crucible means having concentric nozzle means for drawing off a light conducting fiber, the inner crucible means being arranged so that the distance between the concentric nozzles is variable, the inner crucible means being arranged to be rotatable and means to rotate said inner crucible means.

4,118,213

METHOD AND APPARATUS FOR FIBERIZING ATTENUABLE MATERIALS AND PRODUCT THEREOF

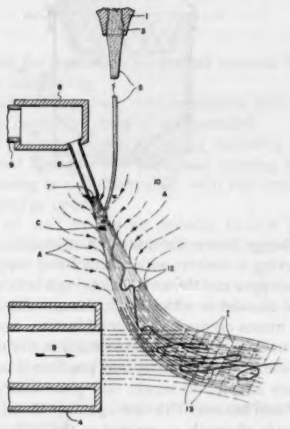
Marcel Levecque, Saint-Gratien; Jean A. Battigelli, and Dominique Plantard, both of Rantigny, all of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 557,282, Mar. 11, 1975, Pat. No. 4,015,964, which is a continuation-in-part of Ser. No. 353,984, Apr. 24, 1973, Pat. No. 3,885,940. This application Apr. 14, 1976, Ser. No. 676,755

Claims priority, application France, Feb. 9, 1976, 76 03416

Int. Cl.[2] C03B *37/04*

U.S. Cl. 65—5 **31 Claims**



1. A process for converting attenuable material into a fiber comprising generating a gaseous blast and a gaseous jet, the direction and the kinetic energy per unit of volume of the jet being such that the jet penetrates into the blast, thereby forming a zone of interaction in proximity of the path of penetration of the carrier jet into the blast, and delivering a stream of the attenuable material to the boundary of the blast so as to enter the zone of interaction, the source of the carrier jet being spaced from the blast and the said stream of material being first introduced into currents of ambient gas induced by the carrier jet to subject the stream to an initial or partial attenuation and form a continuous filament before reaching the boundary of the blast, the partially attenuated stream being thereafter drawn into a fiber by a second attenuation in the zone of interaction.

4,118,214

TREATING POLYCHROMATIC GLASS IN REDUCING ATMOSPHERES

Brent M. Wedding, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jun. 22, 1977, Ser. No. 808,863

Int. Cl.[2] C03C *15/00*; C03B *32/00*; C03C *3/04*

U.S. Cl. 65—30 R **21 Claims**

1. A method for making a polychromatic glass article

wherein at least a portion thereof is integrally colored by silver which consists of the steps:

(a) melting a batch for a glass containing the constituents of alkali fluoride, the constituents of at least one silver halide selected from the group consisting of AgCl, AgBr, and AgI, and 0–0.2% CeO_2;

(b) forming said melt into a glass article;

(c) exposing at least a portion of said article to high energy or actinic radiation selected from the group consisting of high velocity electrons, X-radiations, and ultra-violet radiations to develop a transparent latent image;

(d) heating at least said exposed portion of said article to a temperature between about the transformation range of the glass and the softening point thereof for a sufficient length of time to cause nucleation and growth of microcrystals of alkali fluoride containing at least one silver halide selected from the group consisting of AgCl, AgBr, and AgI;

(e) subjecting at least said exposed portion of said article to a gaseous reducing atmosphere at a temperature of at least 350° C., but less than about the strain point of the glass, for a sufficient length of time to cause metallic silver to be deposited as discrete colloidal particles less than 200A in the smallest dimension, and/or deposited within said microcrystals, the silver-containing part of the microcrystal being less than about 200A in the smallest dimension, and/or deposited upon the surface of said microcrystals, the portion of the microcrystal coated with silver being less than about 200A in the smallest dimension, said microcrystals having a concentration of at least 0.005% by volume, whereby color is produced in said exposed portion of said article; and then

(f) cooling said article to ambient temperature.

11. A method for making a monochromatic glass article wherein at least a portion thereof is integrally colored by silver which consists of the steps:

(a) melting a batch for a glass containing the constituents of alkali fluoride, the constituents of at least one silver halide selected from the group consisting of AgCl, AgBr, and AgI, a thermoreducing agent, and 0–0.2% CeO_2;

(b) forming said melt into a glass article;

(c) heating at least a portion of said article to a temperature between about the transformation range of the glass and the softening point thereof for a sufficient length of time to cause nucleation and growth of microcrystals of alkali fluoride containing at least one silver halide selected from the group consisting of AgCl, AgBr, and AgI;

(d) subjecting at least said heated portion of said article to a gaseous reducing atmosphere at a temperature of at least 350° C., but less than about the strain point of the glass, for a sufficient length of time to cause metallic silver to be deposited as discrete colloidal particles less than 200A in the smallest dimension, and/or deposited within said microcrystals, the silver-containing part of the microcrystal being less than about 200A in the smallest dimension, and/or deposited upon the surface of said microcrystals, the portion of the microcrystal coated with silver being less than about 200A in the smallest dimension, said microcrystals having a concentration of at least 0.005% by volume, whereby a single color is produced in said heated portion of said article; and then

(e) cooling said article to ambient temperature.

4,118,215
METHOD AND APPARATUS FOR HEATING GLASS IN A FOREHEARTH

Jean Albert Brax, Chalon sur Saone, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Sep. 16, 1977, Ser. No. 833,965
Claims priority, application France, Sep. 21, 1976, 76 28322
Int. Cl.² C03B *5/22*
U.S. Cl. 65—134 **11 Claims**

1. A method for heating molten glass in a relatively large forehearth communicating with a plurality of relatively small feeder conduits, the method comprising:

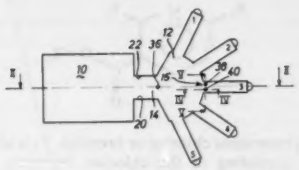
(a) directing a stream of molten glass from an inlet of the forehearth to an inlet of at least one feeder conduit;

(b) passing a centrally disposed electric heating current along said stream between the inlet of the forehearth and the inlet of a feeder conduit providing a source of glass;

(c) whereby said heating is effected by adding a quantity of thermal energy to the molten glass; and

(d) whereby molten glass in the forehearth is maintained at a desired operating temperature.

3. An apparatus for conveying molten glass from a glass furnace which comprises:



(a) a relatively large forehearth for receiving molten glass from the glass furnace, said forehearth having an inlet connecting it to the glass furnace;

(b) a plurality of relatively small feeder conduits having inlets connecting them to the forehearth;

(c) a first electrode centrally inserted in the molten glass adjacent the inlet to the forehearth;

(d) a second electrode inserted in the molten glass adjacent the inlet of at least one feeder conduit; and

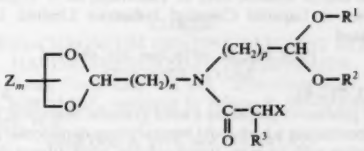
(e) means for energizing said first and second electrodes to produce electric current flow along the molten glass between said electrodes and heat the molten glass passing from the forehearth to said feeder conduit.

4,118,216
N-DIALKOXYALKYL-N-DIOXOLANALKYLENE-α-HALOALKANAMIDES

Roger D. Hotz, Evanston; Leonard J. Stach, Riverside, both of Ill., and Sidney B. Richter, Barberton, Ohio, assignors to Velsicol Chemical Company, Chicago, Ill.

Filed Apr. 25, 1977, Ser. No. 790,360
Int. Cl.² A01N *9/24;* **C07D** *317/30;* **A01N** *9/20*
U.S. Cl. 71—88 **10 Claims**

1. A compound of the formula



wherein Z is lower alkyl; *m* is an integer from 0 to 4; *n* and *p* are each integers from 1 to 2; R^1 and R^2 are each lower alkyl; R^3 is hydrogen or lower alkyl; and X is halogen.

10. A method of controlling weeds which comprises contacting said weeds with an effective amount of a herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of claim **1**.

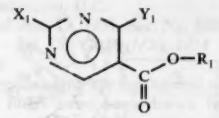
4,118,217

HERBICIDALLY ACTIVE SUBSTITUTED PYRIMIDINE COMPOUNDS AND METHOD OF USING SAME

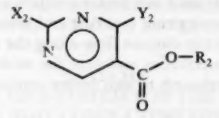
Stephen L. Oestreicher, Mission, Kans., and David P. Hardin, North Kansas City, Mo., assignors to Farmland Industries, Incorporated, Kansas City, Mo.

Filed Jan. 6, 1977, Ser. No. 757,481
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—92 **9 Claims**

1. A method of inhibiting or stopping the growth of emergent weeds which comprise the steps of applying to the weed habitat from about $\frac{1}{4}$ to 10 pounds per acre of a compound selected from the group consisting of (A) compounds of the formula



wherein X_1 represents chlorine or bromine, Y_1 is selected from the group consisting of the chlorine, bromine, alkylamino groups having from 1 to 6 carbon atoms, inclusive, hydroxyalkylamino groups having from 2 to 6 carbon atoms, inclusive, and alkoxy groups having from 1 to 6 carbon atoms, inclusive, and R_1 is selected from the group consisting of alkyl groups having from 1 to 18 carbon atoms, inclusive, benzyl groups, chlorophenyl groups, chlorobenzyl groups, trichloromethylalkyl groups having from 1 to 6 carbon atoms, inclusive, alkylphenyl, the alkyl groups having from 1 to 6 carbon atoms, inclusive, and alkenyl groups having from 3 to 6 carbon atoms, inclusive, and (B) compounds of the formula



wherein X_2 is selected from the group consisting of alkoxy groups having from 1 to 6 carbon atoms, inclusive, alkylthio groups having from 1 to 6 carbon atoms, inclusive, and mercapto groups, Y_2 represents chlorine or bromine, and R_2 is selected from the group consisting of alkyl groups having from 1 to 18 carbon atoms, inclusive, benzyl groups, chlorophenyl groups, chlorobenzyl groups, trichloromethylalkyl groups having from 1 to 6 carbon atoms, inclusive, alkylphenyl, the alkyl groups having from 1 to 6 carbon atoms, inclusive, and alkenyl groups having from 3 to 6 carbon atoms, inclusive.

4,118,218

FORMULATION PROCESS

Nigel Wyndham Drewe, Maidstone; Peter Robin Hodson, and Clive Gilroy Robson, both of Tonbridge, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jun. 14, 1976, Ser. No. 695,414
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—92 **8 Claims**

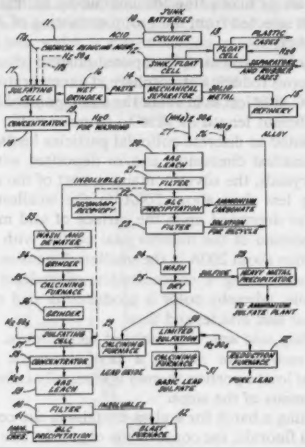
1. A process of preparing a solid granular herbicidal composition containing a herbicidal bipyridylium diquaternary salt in association with an inert, water-soluble, solid diluent therefor, which comprises introducing an aqueous solution of a herbicidal bipyridylium diquaternary salt into a gaseous fluidised bed of particles of the solid, water-soluble, diluent maintained at an elevated temperature such that the solution of the bipyridylium salt rapidly evaporates to deposit the bipyridylium salt as a coating on the particles of the solid diluent without dissolving the diluent particles, and collecting the solid granular herbicidal composition so prepared, the concentration of herbicidal bipyridylium diquaternary salt in the aqueous solution introduced into the fluidised bed being at least 200 grams per liter, and the collected composition containing at least 10% by weight of bipyridylium cation.

4,118,219

PROCESS FOR RECYCLING JUNK LEAD-ACID BATTERIES

Marion Edward Elmore, Mendota Heights, and James Kenneth Klang, St. Paul Park, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 659,277, Feb. 19, 1976, abandoned.
This application Jul. 1, 1977, Ser. No. 812,437
Int. Cl.[2] C22B 13/04
U.S. Cl. 75—103 **30 Claims**



1. A process for recycling the paste and electrolyte of junk lead-acid batteries, said process comprising the steps of

(a) separating the paste and electrolyte from the junk batteries,

(b) reacting the paste and electrolyte to increase the lead sulfate content of the paste and reduce the acid content of the electrolyte,

(c) mixing the resulting paste with an aqueous ammoniacal ammonium sulfae solution to dissolve a substantial portion of the lead sulfate from the paste,

(d) separating the resulting pregnant lead solution from any solid materials therein,

(e) and precipitating lead carbonate from the pregnant lead solution.

30. Lead oxide produced by reacting the paste from junk batteries with sulfuric acid to convert lead oxide therein to lead sulfate, mixing the resulting paste wiith an aqueous ammoniacal ammonium sulfate solution to dissolve a substantial portion of the land sulfate from the paste, separating the resulting pregnant lead solution from any solid materials remaining therein, precipitating lead carbonate from the pregnant lead solution and removing the precipitate from the solution, and converting the lead carbonate to lead oxide by the removal of carbon dioxide from the carbonate.

4,118,220

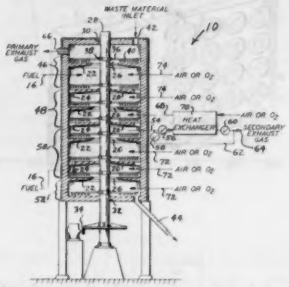
METHOD FOR TREATING WASTE MATERIAL

Charles F. von Dreusche, Jr., Ramsey, and Louis T. Barry, Skillman, both of N.J., assignors to Nichols Engineering & Research Corp., Belle Mead, N.J.

Filed Jul. 19, 1976, Ser. No. 706,615
Int. Cl.[2] C22B 31/00
U.S. Cl. 75—69 **4 Claims**

1. A method of treating waste material containing heavy

metals and carbonaceous material comprising the steps of continuously introducing waste material to be processed through a waste material inlet into a primary furnace while simultaneously adding air to said furnace, heating said waste material in said furnace until it is in a charred state and thence discharging said material from the furnace and passing it to a secondary treatment device while simultaneously discharging



exhaust gas from said furnace, recovering or removing by chemically leaching said heavy metals from said waste material in said secondary treatment device, thereafter passing the remainder of the waste material in the secondary treatment device to a secondary furnace to burn said carbonaceous material remaining in the waste material and separately discharging ash and exhaust gas from said secondary furnace.

4,118,221

COPPER RECOVERY FROM SULFATE SOLUTIONS CONTAINING NICKEL AND COBALT

Victor Alexander Ettel, and Eric August Pierre Devuyst, both of Mississauga, Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Oct. 7, 1977, Ser. No. 849,074
Claims priority, application Canada, Feb. 28, 1977, 272785
Int. Cl.[2] C22B *15/12, 23/04*
U.S. Cl. 75—108 **6 Claims**

1. A method of recovering copper and nickel separately from an acidic sulfate solution thereof comprising the following steps:

I. Treating the solution with a base selected from the group consisting of hydroxides and carbonates of alkali and alkaline earth metals to precipitate substantially all of the copper present and some of the nickel as basic compounds thereof;

II. separating said basic compounds obtained in Step I from an essentially copper-free nickel liquor;

III. reducing the copper present in said basic compounds to elemental copper through formation of cuprous sulfite and thermal dissociation thereof under pressure;

IV. separating said elemental copper produced in Step III from spent solution;

V. reclycling said spent solution obtained in Step IV to perform Step I thereon; and

VI. recovering nickel from said essentially copper-free nickel liquor obtained in Step II.

4,118,222

GLASSY HAFNIUM-BERYLLIUM ALLOYS

Lee E. Tanner, Summit, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jun. 2, 1977, Ser. No. 802,743
Int. Cl.[2] C22C *27/00*
U.S. Cl. 75—134 V **4 Claims**

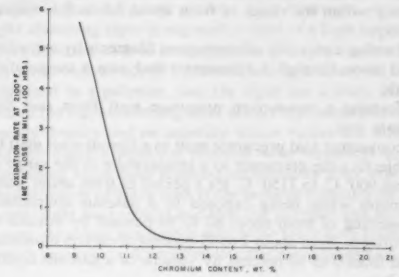
1. A hafnium-base metal alloy which is primarily glassy consisting essentially of about 40 to 60 atom percent beryllium and the balance hafnium plus incidental impurities.

4,118,223

THERMALLY STABLE HIGH-TEMPERATURE NICKEL-BASE ALLOYS

Dennis S. Acuncius; Robert Blanchard Herchenroeder, both of Kokomo; Russell W. Kirchner, Greentown, and William L. Silence, Kokomo, all of Ind., assignors to Cabot Corporation, Kokomo, Ind.

Continuation of Ser. No. 179,922, Sep. 13, 1971, abandoned. This application Feb. 25, 1977, Ser. No. 772,321
The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.
Int. Cl.[2] C22C *19/05*
U.S. Cl. 75—171 **9 Claims**



1. A thermally stable, high-temperature oxidation-resistant, nickel-base alloy containing more than 50% by weight of nickel and consisting essentially by weight

from about 12 to about 18% chromium from about 8 to about 18% molybdenum and a small but effective amount to impart high temperature oxidation resistance of lanthanum not exceeding about 0.25% of the alloy, said alloy also containing by weight any of the following non-essential elements within the ranges indicated provided that the average N_v number as defined herein does not substantially exceed about 2.5:

tungsten: 0 - 15%
cobalt and iron: 0 - 10%
zirconium and titanium: <0.5%
carbon: <0.2%
aluminium: <0.5%
boron: <0.03%
silicon: <1% and
manganese: <2%

with the balance of the alloy being nickel and incidental impurities, and characterized by controlled thermal stability, a low coefficient or expansion and oxidation resistance at temperatures of about 1600° F. and above.

4,118,224

NICKEL-CHROMIUM HEATING ELEMENT ALLOY HAVING IMPROVED OPERATING LIFE

Teh Po Wang, North Caldwell, and Carrol Dean Starr, Whippany, both of N.J., assignors to Wilbur B. Driver Company, Newark, N.J.

Filed Dec. 6, 1976, Ser. No. 747,777
Int. Cl.[2] C22C *19/05*
U.S. Cl. 75—171 **5 Claims**

1. A nickel-chromium heating element alloy consisting essentially of a base composition in weight percent within the range of: 18 to 22 percent chromium, 1.0 to 1.6 weight percent silicon, balance essentially nickel, characterized in that the alloy contains from about 0.1 to 0.75 weight percent hafnium, whereby the operating life of the alloy as a resistance heating element is improved.

4,118,225

METHOD FOR PRODUCING FIBROUS STEEL MATTS

Emerick J. Dobo, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 28, 1975, Ser. No. 626,155
Int. Cl.[2] B22F 3/00
U.S. Cl. 75—207 10 Claims

1. A method for producing a fibrous steel matt from particles of iron oxide with the aid of a fiber-forming acrylic polymer, said method comprising the following steps in sequence:

(A) providing a spinning dope wherein particles of iron oxide having an average diameter of about 5 microns or less are uniformly dispersed in a solution of acrylic polymer with the weight ratio of iron oxide to acrylic polymer being within the range of from about 3:1 to 7:1, respectively;

(B) forming a plurality of continuous filaments by extruding said dope through a spinnerette and into a coagulation bath;

(C) forming a non-woven precursor matt from said filaments; and

(D) converting said precursor matt to a fibrous steel matt by subjecting the precursor to a temperature in the range of from 900° C. to 1150° C. for a period of from about 3 to 8 minutes while being exposed to a gaseous atmosphere consisting of from about 80 to 94 percent by volume of hydrogen, from about 2 to 15 percent of carbon monoxide and from 0 to 10 percent by volume of a gaseous hydrocarbon.

7. A precursor matt which is convertible to a fibrous steel matt when exposed to a reducing environment at a temperature in the range of from about 900° C. to 1150° C. for a period of from about 3 to 8 minutes, said precursor matt being composed of fibers which contain a mixture of iron oxide particles and an acrylic polymer in a weight ratio of from about 3:1 to 7:1, respectively.

9. A method for producing a fibrous steel alloy matt from a mixture of metal oxide particles consisting of iron oxide and one or more other metal oxides capable of being reduced and sintered at conditions effective for accomplishing a reduction and sintering of iron oxide, said method comprising the following steps in sequence:

(A) providing a spinning dope wherein said mixture of metal oxide particles having an average diameter of about 5 microns or less are uniformly dispersed within a solution of acrylic polymer with the weight ratio of iron oxide to acrylic polymer being within the range of from about 3:1 to 7:1, respectively;

(B) forming a plurality of filaments by extruding said dope through a spinnerette and into a coagulation bath;

(C) converting said precursor matt to a fibrous steel alloy matt by exposing said precursor to a gaseous atmosphere consisting of from about 80 to 94 percent by volume of hydrogen, from about 2 to 15 percent by volume of carbon monoxide, and from 0 to 10 percent by volume of a gaseous hydrocarbon at a temperature in the range of from about 900° C. to 1150° C. for a period of from about 3 to 8 minutes.

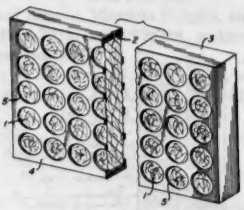
4,118,226

COMBINATION AIR FILTER AND AIR TREATING DEVICE

Richard Lawrence Bourassa, 3406 Lisa Cir., Waldorph, Md. 20601

Filed Mar. 22, 1977, Ser. No. 780,095
Int. Cl.[2] B01D 50/00
U.S. Cl. 55—279 7 Claims

1. An integral disposable combination air filter and air freshener device for a forced air ventilation system comprising; a filtering element having opposed surfaces, opposed top and bottom edges, and opposed side edges; at least one of said opposed edges having in integral contact therewith a solid medium of concentrated air freshening aromatics and being adapted to slowly discharge into the ventilation system air freshener aromatics; and disposable container means enclosing said filtering element and solid medium having respective and corresponding surface portions, top and bottom portions, and



side portions, said container means having perforations therein for allowing unrestricted air flow through the air filtering element.

4,118,227

PROCESS FOR PRODUCING DICALCIUM SILICATE POWER

Tomoo Shiohara, Kyoto; Minoru Miyamoto, Suita, and Nobuo Tamaki, Kyoto, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Japan

Filed May 20, 1977, Ser. No. 799,131
Claims priority, application Japan, May 24, 1976, 51-60407; Mar. 23, 1977, 52-32589; Mar. 23, 1977, 52-32590
Int. Cl.[2] C09C 1/02
U.S. Cl. 106—306 25 Claims

1. A process for producing a fine powdery γ-dicalcium silicate which comprises mixing a calcium oxide componenet, a silicon dioxide component, and at least one compound selected from the group consisting of titanium oxide, zinc oxide, alkali metal chlorides and alkaline earth metal chlorides; burning the mixture; and recovering the resulting fine powdery γ-dicalcium silicate.

4,118,228

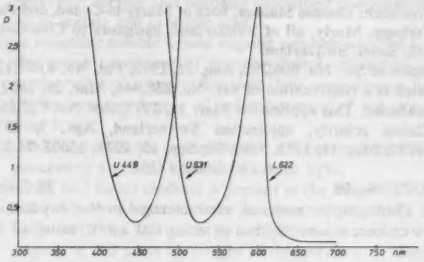
PHOTOGRAPHIC MATERIALS SUITED FOR THE PRODUCTION OF COLOR SEPARATIONS

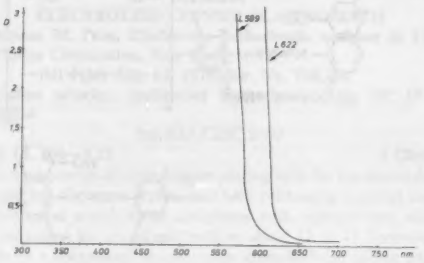
Hans Josephus Corluy, Berchem, Belgium; Franz Moll, Leverkusen-Steinbuchel, Fed. Rep. of Germany; Herbert Müller, Leverkusen, Fed. Rep. of Germany, and Marie Hase, Schildgen-Berg. Gladbach, Fed. Rep. of Germany, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

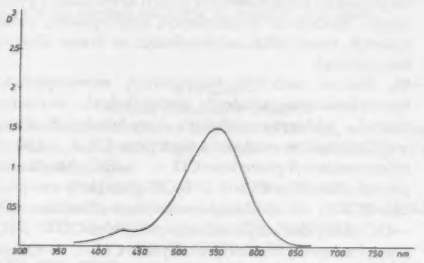
Filed Jul. 22, 1976, Ser. No. 707,882
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1975, 2533602
Int. Cl.[2] G03C 7/16, 1/76
U.S. Cl. 96—17 14 Claims

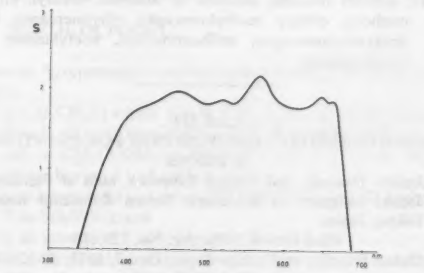
1. In a photographic panchromatic black-and-white silver halide recording material having two silver halide emulsion layers wherein a first layer has a panchromatic sensitivity, and a second layer has a blue sensitivity which as determined by the Relative Sensitivity Test as defined in the specification is at least 0.6 log I.t units higher than each of its green and red sensitivities, and both said first and second layers have substantially the same threshold sensitivity to blue light; the improve-

ment whereby at least said first layer is spectrally sensitized so that the spectral sensitivity of the photographic material measured at density 1.0, is at least 0.8 powers of ten lower at 650 nm than at 620 nm, and decreases further beyond 650 nm.









4,118,229

HIGH ENERGY RECORDING ON AN ACETYL ACETONATE

Ilse-Dore Stromberger-D'Alton-Rauch; Karl Klose, both of Hamburg; Udo Bergmann, Schwarzenbek; Alfred Glattli, Hamburg, all of Fed. Rep. of Germany, and Claus-Peter Hodum, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 24, 1976, Ser. No. 726,266

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1975, 2542680

Int. Cl.[2] G03C *5/04*

U.S. Cl. 96—27 H **8 Claims**

1. A method for recording irreversible data which become visible immediately and without after-treatment, in which a light absorbing layer is exposed to light of a high intensity and short duration with an image pattern, characterized in that the layer contains an acetyl acetonate which is dissolved or finely dispersed in a polymer, that the light has a wave length, at which the light-absorbing layer shows high absorption, and an energy density and an intensity whose values are sufficiently high to cause a print-out reaction with the acetyl acetonate containing layer used resulting immediately after exposure in the formation of black dots at the areas of exposure on a transparent light background and that the polymer and acetyl acetonate are mixed in a ratio in which the layer has a transmission which amounts to 0.1 to 90% for the wave length chosen.

4,118,230

PROCESS FOR ADJUSTING EXPOSURE MASKS RELATIVE TO A SUBSTRATE WAFER

Hans Binder, Unterpfaffenhofen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 22, 1977, Ser. No. 835,746

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642634

Int. Cl.[2] G03C *5/04, 5/00*

U.S. Cl. 96—27 R **6 Claims**

1. In a method for adjusting individual exposure masks relative to a substrate during consecutively performed photolithographic processes wherein the substrate is provided with an adjustment structure by means of a photolithographic step employing a first mask and the method includes at least two additional photolithographic processes being consecutively performed on the substrate with each process including adjusting an exposure mask on the substrate by aligning adjustment structure on the mask to coincide with the adjustment structure of the substrate, said process causing the dimension of the adjustment structure of the mask to be reproduced on the adjustment structure of the substrate, the improvements comprising providing an adjustment structure for the substrate having a separate pair of adjustment marks for each of the exposure masks so that the number of pairs at least equals the number of exposure masks, providing each of the exposure masks with a single pair of adjustment marks comprising a first and second mark, said pair on one exposure mask being spatially arranged with respect to the pairs on the other exposure masks so that when each of the exposure masks are aligned on the substrate, the pair of adjustment marks of each mask is aligned to coincide with a different pair of marks on the substrate.

4,118,231

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS CONTAINING ANTISTATIC AGENTS

Masayoshi Mayama; Sadatugu Terada; Toshio Muramatsu, all of Hachioji; Masayuki Kimura, Hino; Masao Ishibara, Hino, and Tohru Kobayashi, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd. and Hokuetsu Paper Mills Ltd., both of Tokyo, Japan

Continuation of Ser. No. 582,426, May 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 339,004, Mar. 7, 1973, abandoned. This application Mar. 18, 1977, Ser. No. 779,229

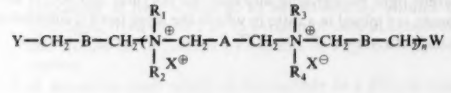
Claims priority, application Japan, Mar. 8, 1972, 47-23141; Mar. 15, 1972, 47-25755

Int. Cl.[2] G03C *1/78, 1/72, 5/28*

U.S. Cl. 96—87 A 3 Claims

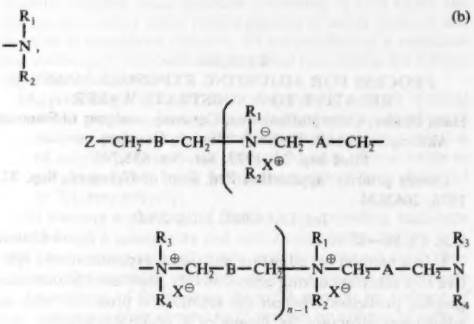
1. A light-sensitive silver halide photographic material comprising a support, a silver halide emulsion layer and a layer consisting essentially of a polymer of the formula

(a)



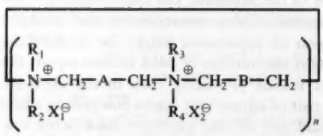
wherein Y and W are individually Cl, Br, I or

(b)



wherein Z is Cl, Br or I, or

(c)



and wherein R_1, R_2, R_3, and R_4 are individually an alkyl or hydroxyalkyl group having 1 to 4 carbon atoms, a hydroxymethylene group, a phenylene group or a mere bond; $X_1^{\ominus}$ and $X_1^{\ominus}$ are individually an anion; and n is an integer of 10 to 30.

4,118,232

PHOTOGRAPHIC MATERIAL CONTAINING SULPHONIC ACID GROUP CONTAINING DISAZO DYESTUFFS

Bernhard Piller; John Lenoir, both of Marly-le-Petit; Alfred Froehlich; Thomas Stauner, both of Marly-le-Grand, and Paul Tschopp, Marly, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

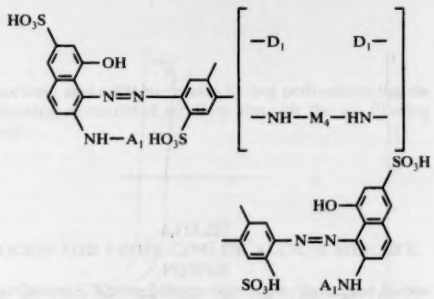
Division of Ser. No. 606,395, Aug. 21, 1975, Pat. No. 4,051,123, which is a continuation of Ser. No. 238,944, Mar. 28, 1972, abandoned. This application Mar. 15, 1977, Ser. No. 777,867

Claims priority, application Switzerland, Apr. 7, 1971, 5058/71; May 14, 1971, 7208/71; Sep. 16, 1971, 13605/71

Int. Cl.[2] G03C *1/10*

U.S. Cl. 96—99 28 Claims

1. Photographic material, characterized in that it contains, on a carrier, a layer with a symmetrical azo dyestuff of the formula



wherein

A_1 denotes hydrogen, methyl, hydroxyethyl, phenyl, lower alkyl phenyl, trifluoromethyl phenyl lower alkoxy phenyl, fluoro-, chloro- or bromophenyl, sulphophenyl, carboxyphenyl, lower alkyl sulphophenyl or lower alkyl carbonylphenyl,

$-M_4$ denotes carbonyl, isophthaloyl, nitroisophthaloyl, benzoylamino-isophthaloyl, terephthaloyl, nitroterephthaloyl, chloroterephthaloyl, naphthalenedicarbonyl, —OC-phenylene-methylene-phenylene-C0—, —OC-phenylene-carbonyl-phenylene-CO—, —OC-phenylene-sulphonyl-phenylene-CO—, —OC-phenylene-azo-phenylene-CO—, —OC-phenylene-ureylene-phenylene-CO—, —OC-phenylene-ethylenedioxy-phenylene-CO— —CO-phenylene-pentylenedioxy-phenylene-CO—, —OC-phenylene-CO-HN-phenylene-CO- or —OC-phenylene-CO-HN-$(CH_2)_p$-HN-OC-phenylene-CO—, p being 2, 3 or 4, and

D_1 denotes fluorine, chlorine or bromine, methyl, ethyl, methoxy, ethoxy, methylmercapto, ethylmercapto, hydroxyethylmercapto, trifluoromethyl, acetylamino or benzoylamino.

4,118,233

PHOTOSENSITIVE COMPOSITION FOR PRINTING SCREENS

Takahiro Tsunoda, and Tsuguo Yamaoka, both of Funabashi, Japan, assignors to Murakami Screen Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1976, Ser. No. 729,610

Claims priority, application Japan, Oct. 7, 1975, 50-121045

Int. Cl.[2] G03C *1/68*

U.S. Cl. 96—115 P 12 Claims

1. A photosensitive composition in solution for printing screens comprising:

(a) a liquid medium selected from the group consisting of

water-miscible organic solvents and solvent mixtures of said organic solvents and water;

(b) a polymer soluble in both said organic solvents and water selected from the group consisting of partially saponified polyvinyl acetate and partially saponified copolymers of vinyl acetate and crotonic acid;

(c) a sensitizer soluble in said organic solvents selected from the group consisting of pentaerythritol triacrylate and pentaerythritol tetraacrylate and their prepolymers having an average degree of polymerization of not greater than 5; and

(d) an initiator soluble in said organic solvents and capable of generating a radical upon exposure to light,

wherein said liquid medium is present in the range of 150 to 800 parts by weight and the sensitizer is present in the range of 20 to 400 parts by weight, respectively, with respect to 100 parts by weight of the polymer.

4,118,234

ELECTROLESS COPPER PLATING BATH

Johannes M. Jans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,111

Claims priority, application Netherlands, Aug. 19, 1975, 7509824

Int. Cl.[2] C23C *3/02*

U.S. Cl. 106—1.23 **2 Claims**

1. An aqueous alkaline copper plating bath for the electroless deposition of copper layers, said bath containing cuprous ions, a compound which forms complexes with cuprous ions, alkali for adjusting the ph of said bath to about 12 to 13, formaldehyde or a compound which yields formaldehyde and in addition, as a stabilizer, a nitro benzene compound ring substituted with at least one moiety selected from the group consisting of aldehyde, methyl, sulfonic acid and nitro, said stabilizer being present in an amount sufficient to stabilize said bath.

4,118,235

MOLD RELEASE AGENT

Norio Horiuchi; Shin-ichi-ro Kai, both of Ibaragi, and Masayoshi Shinjo, Settu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Sep. 15, 1976, Ser. No. 723,639

Claims priority, application Japan, Sep. 18, 1975, 50-113440; Sep. 25, 1975, 50-116228; Sep. 30, 1975, 50-118583

Int. Cl.[2] B28B *7/36*

U.S. Cl. 106—38.22 **11 Claims**

1. A mold release composition comprising

a. a perfluoroalkyl group-containing phosphoric acid ester represented by the formula:

$$(R_fYC_qH_{2q}O)_nPO(OH)_{3-n}$$

wherein: R_f represents a perfluoroalkyl having 4 to 20 carbon atoms;

Y is $CH_2CH(Z)$ where Z is H, CH_3, C_2H_5, Cl or OR where R is H, CH_3, C_2H_5, $COCH_3$, COC_2H_5 or CH_2COOH or a salt of CH_2COOH, or $SO_2N(R')$ where R' is an alkyl group having 1 to 4 carbon atoms;

q is an integer of 0 to 4 when Y is $CH_2CH(Z)$ or 1 tO 4 when Y is $SO_2N(R')$; and

n is an integer of 1 to 3, or a salt thereof;

b. an additive selected from the group consisting of non-curable polysiloxanes and highly fluorinated organic compounds, said additives being a liquid or solid at room temperature and having a boiling point not lower than 100° C. and a melting point not higher than 150° C.; and

c. a liquid carrier.

4,118,236

CLAY COMPOSITIONS

Clive Arnold Erskine, Forestville, Australia, assignor to ACI Technical Centre Pty Ltd., Waterloo, Australia

Filed Mar. 9, 1977, Ser. No. 775,869

Claims priority, application Australia, Mar. 15, 1976, PC5218

Int. Cl.[2] C04B *35/00*

U.S. Cl. 106—71 **26 Claims**

1. A method of producing reinforced thin sectioned clay based articles, such as sheets, pipes or the like, having a modulus of rupture of at least 10 MPa and a modulus of elasticity no greater than 16 GPa, including the steps of forming a shaped mixture comprising the following ingredients in substantially the proportions specified by percentage weight of the total solids in the composition:

Fibrous reinforcement selected from the group consisting of glass fibre, carbon fibre, mineral wool, ceramic fibre, asbestos or mixtures of two or more thereof — 1% to 30%

Clay selected from the group consisting of montmorillonitic clay, kaolinitic clay, illitic clay, or mixtures of two or more thereof — 5% to 95%

Fillers — 0% to 90%

Water — 20% to 100%

drying the shaped mixture, and firing the dried shapes at a temperature in the range of 500° C. to 800° C. for a time sufficient to produce substantial stabilisation against redispersion in water of the clay in the composition without forming a ceramic article therefrom.

4,118,237

GLASS-CERAMICS DISPLAYING INHERENT LUBRICITY

George H. Beall, Big Flats; Kenneth Chyung, Painted Post, and Syed N. Hoda, Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,692

Int. Cl.[2] C03B *32/00;* **C03C** *3/22*

U.S. Cl. 106—39.6 **4 Claims**

1. A method for making a glass-ceramic article exhibiting the properties of lubricity and excellent resistance to wear and having a crystal content in excess of 50% by volume wherein norbergite constitutes the predominant crystal phase, which consists in the steps of:

(a) melting a batch for a glass consisting essentially, by weight on the oxide basis, of about 12–40% MgO, 3–15% Al_2O_3, 35–55% SiO_2, and 5–15% F, the sum of those four components constituting at least 75% by weight of the total composition;

(b) simultaneously cooling said melt to a temperature at least below the transformation range and shaping a glass article therefrom; and then

(c) heating said glass article to a temperature between about 850°–1150° C. to cause the growth in situ of crystals.

4. A glass-ceramic article made in accordance with the method of claim 1.

4,118,238

OPTICAL GLASS

Kazufumi Ishibashi, Sagamihara; Shizuo Matsumaru, Yokohama, and Takeo Ichimura, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 22, 1976, Ser. No. 707,649

Claims priority, application Japan, Jul. 28, 1975, 50-91161

Int. Cl.[2] C03C *3/14*

U.S. Cl. 106—47 Q **5 Claims**

1. Thorium-free optical glass having a refractive index of 1.71 to 1.85 and Abbe number of 40 to 57 containing oxygen ions and fluorine ions as anions, in which cations in the glass calculated as oxides are present in the following ranges of percentage by weight:

B_2O_3	12–26,

-continued

La_2O_3	41–48,
Y_2O_3	8–11,
ZrO_2	1–8,
Ta_2O_5	6–14,
Gd_2O_3	0–12,
Nb_2O_5	0–19,
RO	0–4,
PbO	0–10,
TiO_2	0–8, and
GeO_2	6–23,

where RO is an ingredient or a combination of two or more ingredients of MgO, CaO, SrO, BaO and ZnO, and part of the oxygen ions is substituted for 0.6 to 1.5% by weight of fluorine ions relative to the glass.

4,118,239

ALKALI-RESISTANT GLASS FIBER COMPOSITION

Lawrence Vincent Gagin, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Sep. 6, 1977, Ser. No. 830,549
Int. Cl.[2] C03C *13/00, 3/04;* **C04B** *31/06*
U.S. Cl. 106—50 **7 Claims**

1. An alkali-resistant glass composition capable of being fiberized, which consists of, in a total of 100 parts by weight.

SiO_2	50–62 parts
Al_2O_3	1–11 parts
ZrO_2	4–10 parts
ZnO	0.5–7 parts
Group IA metal oxide	10–19 parts
Group IIA metal oxide	3–15 parts

Fluorine calculated as calcium fluoride 1–4 parts.

4,118,240

ALUMINUM TITANATE COMPOSITION BEING STABLE AT HIGH TEMPERATURE

Mitsuo Takabatake, Yokohama, Japan, assignor to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 11, 1977, Ser. No. 823,740
Claims priority, application Japan, Sep. 14, 1976, 51-109421
Int. Cl.[2] C04B *35/02, 35/44, 35/46, 35/50*
U.S. Cl. 106—73.33 **6 Claims**

1. An aluminum titanate composition having a low coefficient of thermal expansion (20° to 1000° C.) and which is stable at high temperatures and essentially unaffected by reducing atmospheres at high temperatures which consists essentially of 1.5 to 10 wt. % of SnO_2, 2–13 wt. % of SiO_2 and aluminum titanate.

4,118,241

MORTAR COMPOSITIONS AND METHOD OF MAKING SAME

Frank E. Bernett, Yardley, Pa., assignor to Tile Council of America, Inc., Princeton, N.J.

Continuation of Ser. No. 525,054, Nov. 19, 1974, abandoned.
This application Jul. 27, 1976, Ser. No. 709,176
Int. Cl.[2] C04B *7/02*
U.S. Cl. 106—90 **46 Claims**

1. A dry composition capable of being mixed with water to form a mortar, said dry composition comprising in percentages by weight of the dry composition

40 to 70 percent of an inert filler,

0.2 to 1.0 percent of a water soluble cellulose ether having a viscosity of 4,000 cps to 30,000 cps in 2 percent solution,

an antifoam component present in an amount from 0.05 to 1.0 percent based upon the weight of the composition wherein said antifoam component enables the dry composition to be mixed with water by machine to form a mortar having an air content of between 5 and 20 percent based upon the volume of the mixed mortar, and

a hydraulic cement in an amount to balance.

4,118,242

PROCESS FOR MANUFACTURING CONCRETE OF HIGH CORROSION RESISTANCE

Olav Kjöhl, Heistad, and Paul Henrik Olstad, Brevik, both of Norway, assignors to Aksjeselskapet NORCEM, Oslo, Norway

Filed Jul. 13, 1977, Ser. No. 815,418
Claims priority, application Norway, Jul. 9, 1976, 762401
Int. Cl.[2] C04B *7/02*
U.S. Cl. 106—98 **13 Claims**

1. In a method of manufacturing concrete having resistance to corrosion, which comprises mixing cement, sand, water, reactive silica and, optionally, conventional concrete additives, the improvement wherein the cement has a low aluminate content, and at least 10 weight percent of finely divided, non-pozzolanic, reactive silica, based on the weight of the cement, is incorporated in and distributed uniformly throughout the concrete.

4,118,243

PROCESS FOR DISPOSAL OF ARSENIC SALTS

Mahendra D. Sandesara, South Holland, Ill., assignor to Waste Management of Illinois, Inc., Palos Heights, Ill.

Filed Sep. 2, 1977, Ser. No. 830,237
Int. Cl.[2] C04B *11/10*
U.S. Cl. 106—109 **20 Claims**

1. A process for converting a waste material containing water-soluble arsenic salts to a waste material containing water-insoluble arsenic salts which comprises mixing an aqueous system comprising said water-soluble arsenic salts, sulfuric acid and calcium hydroxide in the presence of sufficient ferrous ions to ensure proper curing of the aqueous system to solid form, and sufficient iron in the aqueous system, either in ferrous and/or ferric form, to react with arsenic derived from the water-soluble arsenic salts present, whereby the aqueous system is formed into a slurry, the slurry being contacted with an oxygen containing gas to oxidize the slurry due to contact of the slurry with the oxygen, thus causing the entire slurry to cure to solid form.

15. The process of claim **1** which further comprises disposing of said solid form in a secure landfill.

4,118,244

PARAFFIN WAX COMPOSITION

Charles M. Selwitz, Monroeville, and Helen I. Thayer, Oakmont, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jun. 17, 1977, Ser. No. 807,370
Int. Cl.[2] C08L *91/06*
U.S. Cl. 106—270 **5 Claims**

1. A paraffin wax composition of improved hardness comprising paraffin wax and an alkenyl succinic compound selected from the group consisting of an alkenyl succinic anhydride and the corresponding alkenyl succinic acid wherein the alkenyl portion thereof contains from about 30 to about 60 carbon atoms, said alkenyl succinic anhydride having been obtained by reacting maleic anhydride with an olefinic fraction having from 30 to 60 carbon atoms, said olefinic fraction having been obtained by the ploymerization of ethylene.

4,118,245

METHOD FOR PRODUCING CLAY SLURRIES

Herbert R. Hamill, Iselin, and David E. Potts, Millington, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Sep. 16, 1977, Ser. No. 833,861
Int. Cl.[2] C09C *1/42*
U.S. Cl. 106—288 B 3 Claims

1. A method for producing a concentrated stable fluid slurry of a calcined kaolin clay pigment which comprises providing a fluid dispersed suspension of said pigment in water, said suspension containing from about 45 to 60% solids, pumping said suspension upwardly through a bed of spherical particulate zircon grinding medium in a vertical agitator mill to an agitated tank and continuously recirculating said slurry through said mill and said tank until the viscosity of said suspension is reduced, said grinding medium being retained in said mill while the slurry is being recirculated, adding dry calcined clay in increments to the suspension in said tank while continuing to recirculate said suspension through said mill and said tank until sufficient dry clay is added to produce a fluid slurry containing at least 65% clay solids.

4,118,246

PROCESS FOR PRODUCING CLAY SLURRIES

John P. Horzepa, Edison, and David E. Potts, Millington, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Sep. 22, 1977, Ser. No. 835,510
Int. Cl.[2] C09C *1/42*
U.S. Cl. 106—288 B 10 Claims

1. A method for producing a concentrated fluid aqueous slurry of finely divided particles of calcined kaolin clay which comprises charging said clay particles with water and a dispersant sufficient to form a fluid slurry of about 60 to 70% solids content to one end of a horizontal continuous rotor and stator unit with helical ridges on both stator shell and rotor to provide intense axial shearing action with controlled feedthrough and back mixing, said rotor operating at high speed, said clay particles and water being added in relative proportions such that the admixture discharged from the other end of the mill has a smooth consistency and is a fluid when no agitation is applied but is converted to a viscous dilatant mass when subjected to high shear mixing, discharging the resulting smooth dilatant makedown slurry from the other end of said unit, and recirculating said makedown slurry through said unit a multiplicity of times at a higher throughput rate than used to produce said smooth dilatant slurry, thereby producing a fluid concentrated slurry product having reduced dilatancy.

4,118,247

SUSPENSIONS OF REACTIVE ACIDIC CLAY PIGMENTS

Francis R. Marchetti, Skillman; William E. Zentz, Iselin, and Richard R. Berube, Keyport, all of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Oct. 3, 1977, Ser. No. 838,567
Int. Cl.[2] C09C *1/42*
U.S. Cl. 106—308 N 12 Claims

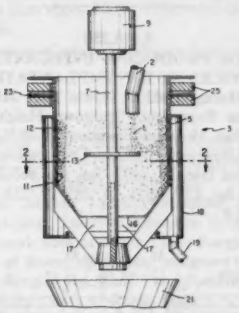
1. An aqueous slurry of acid-treated montmorillonite pigment adapted for use in carbonless copying paper containing a dispersant-effective amount of a sodium condensed phosphate salt and from about 0.5 to 5% by weight of said pigment of an alkanolamine selected from the group consisting of 2-amino-2-methyl-1-propanol, tris(hydroxymethyl)-aminomethane and 2-amino-2-ethyl-1,3 propanediol.

4,118,248

AUTOMATIC DISCHARGE CENTRIFUGE AND METHOD

Jorge Halder Lacher, Apartado 285, Alajuela, Costa Rica

Filed Mar. 17, 1977, Ser. No. 778,353
Int. Cl.[2] C13F *1/10*; B04B *3/00*
U.S. Cl. 127—19 7 Claims



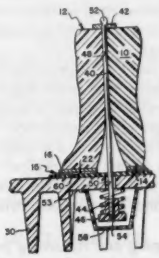
1. A method for separating sugar crystals from fluid matter containing sugar crystals, said method comprising:
rotating said matter at a speed greater than 1200 r.p.m. to subject it to a centrifugal force;
restraining said crystals, urged by said force, from movement beyond a predetermined point defined by a screen means fixedly mounted to the inside surface of a rotatably mounted drum;
passing undesired portions of said matter away from said crystals and through said screen means simultaneously with restraining step;
applying a braking force to bring the drum to substantial rest in less than approximately one second, said crystals being caused to disengage from said screen means and continue rotation by the resulting inertial force; and
collecting said crystals.

4,118,249

MODULAR ASSEMBLY OF A PHOTOVOLTAIC SOLAR ENERGY RECEIVER

Robert M. Graven, Downers Grove; Anthony J. Gorski, Lemont; William W. Schertz, Batavia, and Johan E. A. Graae, Elmhurst, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 30, 1977, Ser. No. 829,122
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 PC 8 Claims



1. A modular assembly of a photovoltaic solar energy receiver, comprising:
a concentrator element, a solar cell package which when subjected to large temperature differences over time will

expand and contract, a first heat sink having a surface larger than said solar cell package positioned with said solar cell package between and in contact with both said concentrator element and said heat sink, and biasing means for exerting force holding said surface of said first heat sink against said cell package thereby allowing for differential heat expansion between said solar cell package, said concentrator element and said heat sink.

4,118,250

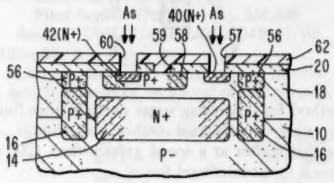
PROCESS FOR PRODUCING INTEGRATED CIRCUIT DEVICES BY ION IMPLANTATION

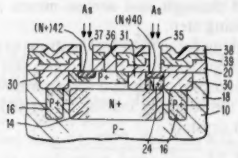
Cheng Tzong Horng, Fishkill; Alwin Earl Michel, Ossining; Hans Stephan Rupprecht, Yorktown Heights, and Robert Otto Schwenker, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 865,805

Int. Cl.[2] H01L *21/265, 21/223*

U.S. Cl. 148—1.5 **11 Claims**





1. An improved process for making an integrated circuit semiconductor device in a monocrystalline semiconductor substrate comprising:

forming a subcollector region of a first conductivity type in a monocrystalline semiconductor substrate of a second opposite conductivity type,

depositing an epitaxial layer of semiconductor material on said substrate,

oxidizing the surface of said epitaxial layer to form a layer of thermally grown SiO_2 having a thickness in the range of 500 to 2500 A,

forming an annular shaped isolation means that at least encompasses the region of said epitaxial layer overlying said subcollector region,

depositing a first layer of photoresist over the layer of SiO_2,

exposing, developing and removing a portion of said first layer of photoresist to define a window for a base region overlying in part said subcollector,

ion implanting an impurity of a second conductivity through the window to form a base region,

removing said first layer of photoresist,

depositing a second layer of photoresist over the layer of SiO_2,

exposing, developing and removing portions of said second layer of photoresist to define windows for the collector contact, the base contact, and the emitter contact,

removing the exposed areas of said layer of SiO_2 to define the collector contact, the base contact and the emitter contact,

removing said second layer of photoresist,

depositing a third layer of photoresist,

exposing, developing and removing portions of said third layer of photoresist to redefine the collector contact and the emitter contact,

ion implanting an impurity of a first conductivity to form the collector contact region and the emitter region,

removing said third layer of photoresist,

heating the resultant device at a temperature in the range of 900° to 1100° C. to activate the implanted first and second type impurities, and to drive in the ion implanted first impurity in said emitter region,

deposit the metallurgy system.

4,118,251

PROCESS FOR THE PRODUCTION OF A LOCALLY HIGH, INVERSE, CURRENT AMPLIFICATION IN A PLANAR TRANSISTOR

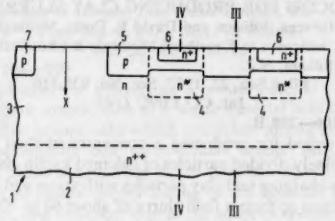
Helmuth Murrmann, Ottobrunn, and Ernst Wittenzellner, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 8, 1976, Ser. No. 739,730

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1975, 2554426

Int. Cl.[2] H01L *21/265, 21/26*

U.S. Cl. 148—1.5 **6 Claims**



5. A process for the production of a locally high, inverse current amplification in a preferably double-diffused or implanted, inversely operated planar transistor, which is provided in a semiconductor body with an integrated circuit, which comprises forming an epitaxial layer of one conductivity type on a high doped semiconductor substrate of the same conductivity type, implanting ions of said one conductivity type into said semiconductor body to form an emitter region with high doping beneath the zone provided for the collector, forming a base region by diffusion or ion implantation of the opposite conductivity type in said epitaxial layer above said emitter region to thereby form an emitter-base junction, said base region extending laterally beyond a projection of said emitter region, and forming a collector region in said epitaxial layer above said emitter region with a portion of the base region lying therebetween, and subjecting said substrate to temperature treatment, thereby causing ions to diffuse out into the adjoining zones.

4,118,252

PROCESS FOR ALBEDO CONTROL OF MOLYBDENUM ARTICLES

Terry L. VanderWert, S. St. Paul, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Filed May 9, 1977, Ser. No. 794,736

Int. Cl.[2] G02B *1/10*

U.S. Cl. 148—6.3 **2 Claims**

1. The process of obtaining the proper albedo on the surface of a molybdenum article comprising:

A. cleaning the molybdenum article to remove impurities on the surface of the article;

B. heating the molybdenum article in an air atmosphere to a

temperature in excess of 400° F. but less than 1100° F. for about 25 minutes to about 35 minutes until the surface of the article has been oxidized; and

C. allowing the molybdenum article to cool.

4,118,253

NON-FLAMMABLE SOLVENT PHOSPHATIZING COMPOSITIONS YIELDING NON WATER SOLUBLE COATINGS

Edward A. Rowe, Jr., Mentor, and William H. Cawley, Painesville, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 560,377, Mar. 20, 1975, Pat. No. 4,029,523. This application Dec. 30, 1976, Ser. No. 755,680

The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.

Int. Cl.² C23F *7/10*

U.S. Cl. 148—6.15 R **8 Claims**

1. A non-flammable organic phosphatizing composition having a continuous and homogeneous liquid phase suitable for phosphatizing metal with a coating of at least substantial water insolubility, with said liquid phase containing water in minor amount, which composition comprises:

(A) halogenated organic solvent providing liquid phase homogeneity with an organic solubilizing liquid while being a non-solvent for a phosphatizing proportion of phosphoric acid in said composition, said halogenated organic solvent being unreactive with phosphoric acid in said composition, and having halogens selected from the group consisting of chlorine, fluorine and mixtures thereof;

(B) solubilizing liquid capable of solubilizing phosphoric acid in said composition while retaining liquid phase composition homogeneity, said solubilizing liquid being unreactive with phosphoric acid in said composition and having a boiling point greater than the boiling point of said halogenated organic solvent or forming an azeotrope with said halogenated organic solvent, wherein said azeotrope boils at a point below the boiling point of said solubilizing liquid and contains above about 80 mole percent of said halogenated organic solvent;

(C) a phosphatizing proportion of phosphoric acid; and,

(D) water in an amount exceeding said proportion of phosphoric acid while being sufficient for said composition to provide a phosphatized coating of substantial water insolubility on a ferrous metal substrate in phosphatizing contact with said composition, and while retaining liquid phase homogeneity.

4,118,254

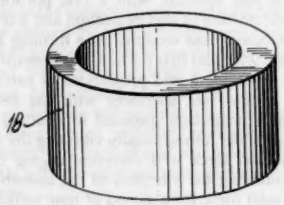
WEAR AND CORROSION RESISTANT NICKEL-BASE ALLOY

Otto Knotek, Aachen, Fed. Rep. of Germany; Erich Lugscheider, Vaals, Netherlands, and Wolfgang Wichert, Aachen, Fed. Rep. of Germany, assigaors to Eutectic Corporation, Flushing, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,376

Int. Cl.² C22C *19/05*

U.S. Cl. 148—32 **12 Claims**



1. A nickel-base wear and corrosion resistant composition consisting essentially by weight about 20% to 35% Cr, about 1% to 8% Si, about 1.7% to 3.5% C., 0 to 15% W and the balance essentially at least about 50% nickel,

the amount of carbon present in said composition being stoichiometrically related to the chromium content to provide carbides based on the formula M_7C_3,

wherein M comprises essentially chromium, the amount of chromium in said M_7C_3 compound ranging from about 65% to less than about 100% of the total chromium in said composition,

the melting point of said composition being less than about 1350° C.

4,118,255

PROCESS FOR THE PRODUCTION OF A SILICON STEEL STRIP WITH HIGH MAGNETIC CHARACTERISTICS

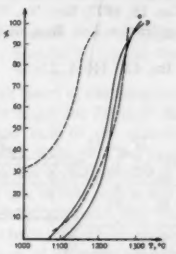
Mario Barisoni, Albano Laziale; Massimo Barteri, Rome; Roberto Ricci-Bitti, Lanuvio; Edmondo G. A. Marianeschi; Sandro C. Basevi, both of Terni; Carlo Borgianni, and Carlo Santafe, both of Rome, all of Italy, assignors to Centro Sperimentale Metallurgico S.p.A and Terni Societa per l'Industria e'Elettricita S.p.A., both of Rome, Italy

Filed Jul. 28, 1976, Ser. No. 709,535

Claims priority, application Italy, Aug. 1, 1975, 50784/75

Int. Cl.² H01F *1/04*

U.S. Cl. 148—111 **8 Claims**



1. A process for inhibiting grain growth in the production of a single oriented continuously cast silicon steel strip with high magnetic characteristics, comprising in sequence:

continuously casting a silicon steel strip;

solubilizing iron sulfide in said silicon steel strip by uniformly heating said silicon steel strip to a temperature between 1050° and 1250° C;

slowly cooling said silicon steel strip to a temperature below 500° C to precipitate dissolved sulphur as manganese sulfide; and

hot-rolling said continuously cast silicon steel strip at a temperature over 1300° C to a thickness of 2 to 3 mm.

4,118,256

PROCESS FOR THE PRODUCTION OF OXYGEN-FREE COPPER CASTING AND MOLDINGS

Karlheinz G. Schmitt-Thomas, Ismaning; Alfred Lipp, Bad Wörishofen, both of Fed. Rep. of Germany, and Karl Schwetz, Sulzberg, Austria, assignors to Electroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 4, 1976, Ser. No. 738,819

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620831

Int. Cl.² C22F *1/08*

U.S. Cl. 148—160 **5 Claims**

1. A process for the production of oxygen-free copper castings and moldings, which contain 0.05 to 0.2% by weight of boron as a micro-alloy element, the steps consisting essentially of:

melting oxygen-containing electrolytic copper in a crucible to produce a melt;

covering the exposed surface of the melt with a protective layer;

immersing an additive consisting essentially of 0.3–1% of a CaB_6, calculated on the weight of said melt, and between 3 and 12.5% of carbon, calculated on the weight of said CaB_6, in said melt, said additive being in the form of a powder having a mean grain size of 300 μm, said step resulting in the production of an oxygen-free, copper-boron binary alloy, which contains 0.5 to 0.2% by weight of boron as the micro-alloy element;

cooling the melt;

molding the cooled melt to yield a solid casting;

solution annealing the casting for a time between about 30 to 600 minutes at a temperature in the range of about 800° C to 950° C; and

aging the quenched annealed casting for an extended time between about 60 to 300 hours at a temperature in the range of about 200° C to 500° C.

4,118,257

METHOD FOR PRODUCING A SEMICONDUCTOR DEVICE HAVING MONOLITHICALLY INTEGRATED UNITS IN A SEMICONDUCTOR BODY

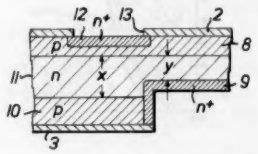
Theodor Oberreuter; Rigobert Schimmer, and Wilhelm Seifert, all of Warstein, Fed. Rep. of Germany, assignors to LICENTIA Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 15, 1977, Ser. No. 777,698

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1976, 2610942

Int. Cl.² H01L *21/22*

U.S. Cl. 148—187 **12 Claims**



1. In a process for producing a semiconductor device having elemental semiconductor units monolithically integrated in a semiconductor body, with said units having a common or a plurality of common zones of one conductivity type with locally reduced thickness and pn-junctions between zones of different conductivity types, and process including the steps of forming a diffusion masking layer on both major surfaces of a semiconductor body of a first conductivity type, removing the portion of said diffusion masking layer on one of said major surfaces which is over the region of said semiconductor body which is to contain the zone of locally reduced thickness in the finished device and, producing the zone structures of the elemental units by diffusing doping substances into the semiconductor body from one and/or both major surfaces in time stages utilizing said masking layers; the improvement comprising, prior to said diffusing step, etching the portion of one of said major surfaces which is over the region of said semiconductor body which is to contain the zone of locally reduced thickness in the finished device to form a groove of desired depth in said semiconductor body with said depth being determined by the intended local reduction in the thickness of the common zone of the elemental semiconductor units in the finished device; and wherein said diffusing step includes subjecting said semiconductor body to a diffusion process for the simultaneous diffusion of a donor and an acceptor doping substance, with one of said doping substances being of the type for which the material of said masking layer is not an effective diffusion mask and being of a concentration sufficiently lower than that of the other doping substance, to cause said one doping substance to diffuse into the portions of both major surfaces of said semiconductor body covered by said masking layers to form zones of one conductivity type and said other doping substance to diffuse into any unmasked portions of said major surfaces to form zones of the opposite conductivity type.

4,118,258

VIBRATION DAMPING THROUGH ADHERENCE TO A LAYER COMPRISING POLYISOPRENE AND THE DAMPED STRUCTURE RESULTING

Bernard Jacques Graveron, Lyon, and Alain Jacques Essel, Caluire, both of France, assignors to Jean Gole, France

Division of Ser. No. 531,326, Dec. 10, 1974, Pat. No. 4,075,288.

This application Apr. 11, 1977, Ser. No. 786,457

Claims priority, application France, Dec. 20, 1973, 73 45839

Int. Cl.² B29C *27/30;* B32B *15/06, 25/04, 31/06;* F16F *15/04*

U.S. Cl. 156—60 **7 Claims**

1. A method of damping vibrations which consists of attaching to the element which causes vibrations a layer of vibration-damping material which comprises polyisoprene in which the total percentage of 1,2- and 3,4-vinyl structures is at least 60%.

6. A support having a layer of a material which comprises polyisoprene containing at least 60% of 1,2- and 3,4-structures.

7. A sandwich structure which comprises two support plates and sandwiched therebetween a material which comprises polyisoprene containing at least 60% of 1,2- and 3-4-structures.

4,118,259

WELDED PLASTIC BEARING CAGE AND METHOD OF MAKING SAME

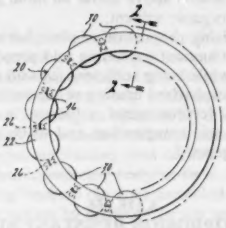
Gerald L. Bingle, St. Clair Shores, Mich., and Melvin L. Earsley, Lubbock, Tex., assignors to Federal-Mogul Corporation, Detroit, Mich.

Division of Ser. No. 501,515, Aug. 29, 1974, Pat. No. 3,944,307.

This application Jan. 2, 1976, Ser. No. 645,968

Int. Cl.² B32B *31/20*

U.S. Cl. 156—73.1 **4 Claims**



1. The method of making a bearing retainer which comprises the steps of providing a pair of molded thermoplastic annular side rails having a plurality of circumferentially spaced axially extending ribs affixed at one of their ends to one of the side rails, providing the exposed end of each rib and the opposed surface of the adjacent side rail with a cooperating aperture and projection adapted to be disposed in axial aligned relationship, forming said aperture with a first portion to slidably receive an end portion of said projection and a second inward portion of reduced cross sectional area forming a shoulder at its intersection with said first portion, preliminarily assembling said rails by positioning said projections in partial telescopic relationship within said apertures with the peripheral end portion of said projection disposed in abutting relationship against said shoulder, ultrasonically vibrating the assembly and applying an axial force in a direction urging the side rails together, continuing the vibration of the assembly and maintaining said axial force for a period of time sufficient to effect a heat softening of the material adjacent to the abutting surfaces of said projections and said apertures to permit a deformation and flow of the material and a further telescopic move-

ment of the projections into the apertures until the side rails move together to the desired spaced substantially parallel relationship, venting the interior of said apertures to the atmosphere to enable escape of entrapped gases from the interior thereof during the telescopic movement of the projections into the apertures, and thereafter discontinuing the vibration and permitting the heat softened material to cool and harden into a welded connection forming an integral bearing retainer.

4,118,260

HEAT RECOVERABLE ARTICLE

Bodo Boettcher, Putzbrunner Str. 86, 8012 Ottobrunn, Fed. Rep. of Germany

Filed Apr. 26, 1976, Ser. No. 680,478

Claims priority, application United Kingdom, Apr. 25, 1975, 17362/75; Apr. 29, 1975, 17773/75

Int. Cl.[2] B29C *27/00, 17/04*

U.S. Cl. 156—85 **11 Claims**

1. A method of protecting a junction containing branched substrates which comprises:

a. depositing a bonding material in at least two strips generally on a portion of the interior of a heat-recoverable sleeve;

b. bonding said strips to form at least one auxiliary conduit;

c. wrapping said sleeve about said junction;

d. heating said sleeve while it is positioned about the junction to an extent sufficient to cause said sleeve to recover.

4,118,261

METHOD FOR REINFORCING SHEET MATERIAL

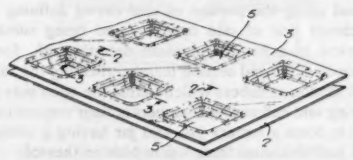
Keith Pedler, 172 Bettington Rd., Carlingford, New South Wales, Australia

Filed Dec. 27, 1976, Ser. No. 754,674

Claims priority, application Australia, Jan. 6, 1976, PC4458

Int. Cl.[2] B32B *3/10, 1/00*

U.S. Cl. 156—145 **5 Claims**



1. A method of reinforcing fibreglass sheet material comprising the steps of:

placing against the surface of said sheet material an inflatable envelope defined by a bi-laminate sheet comprising two layers of pliant thermoplastic material, one overlaying the other and both provided with a plurality of mutually registering perforations, the marginal edge portions of said layers defining the perforations in a registering pair thereof being sealed together, substantially the entire outer periphery of each of said two layers being sealed to or integral with the adjacent outer periphery of the overlying layer;

applying a wet layer of settable reinforcing fibreglass material over said envelope and onto that part of said sheet material which is exposed through said perforations;

inflating said envelope so as to cause said wet layer to assume a cratered form;

allowing said wet layer to solidify thereby to form a reinforcing structure on said sheet material.

4,118,262

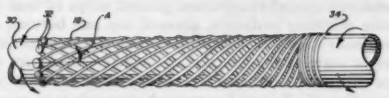
LONGITUDINAL LOAD CARRYING METHOD FOR FIBER REINFORCED FILAMENT WOUND STRUCTURES

Harry Thomas Abbott, Lincoln, Nebr., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 21, 1976, Ser. No. 688,746

Int. Cl.[2] B65H *81/00*

U.S. Cl. 156—175 **6 Claims**



1. In a method of manufacturing a lightweight filament wound casing having connector openings at one end comprising the steps of:

(1) preparing a cylindrical mandrel by inserting a predetermined number of radially projecting, spaced-apart pegs near one end portion thereof,

(2) rotating said mandrel as it is moved longitudially in one direction,

(3) feeding a continuous resin impregnated filament to the surface of said mandrel to lay the filament up in a helical form,

(4) controlling the speed of the longitudinal movement so as to decrease the angle the filament makes with respect to the longitudinal axis of the mandrel as the fiber approaches the area of the pegs and increase the angle as the filament leaves the area of the pegs, said filament being passed around one of said pegs as the direction of longitudinal movement is reversed, the filament being laid up along a helical path around the mandrel back to a starting point, each layer of filaments including at least one pass around each peg in said mandrel;

(5) curing the wound casing,

(6) removing the pegs from the mandrel; and,

(7) removing the casing from the mandrel.

4,118,263

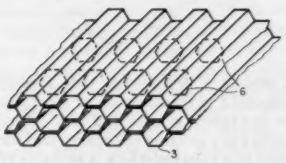
METHOD OF MANUFACTURING STRUCTURAL HONEYCOMB WITH INTEGRAL HEAT RADIATION SHIELDS, AND THE RESULTING PRODUCT THEREOF

William H. Cook, Jr., 875 SE. Shoreland Dr., Bellevue, Wash. 98004

Filed Dec. 30, 1976, Ser. No. 755,819

Int. Cl.[2] B31D *3/02*

U.S. Cl. 156—197 **7 Claims**



1. A method of manufacturing honeycomb having integral heat radiation shielding materials arranged within cells of the honeycomb during its continuous manufacture, using the expansion process, creating at least one heat radiation shield in

each cell of a honeycomb, wherein the radiation shields are formed of expandable pleated ribbons of thin highly reflective shielding material, comprising the steps of:

(a) the conventional step of withdrawing a sheet of honeycomb material from either a roll or a stack;

(b) the conventional step of determining lines, strips, or stripes on this sheet of honeycomb material where bonding of adjacent honeycomb materials is to occur, and when the honeycomb materials need an additional bonding agent, in so doing, providing adhesive lines, strips or stripes where so determined, and when the honeycomb materials are capable of being bonded together with pressure, heat, and/or catalysts, then, in so doing, providing masking materials adjacent the determined lines, strips, or stripes;

(c) the new step of extending across the sheet of honeycomb material spaced compressed pleated strips of heat radiation shielding materials, covered top and bottom, when necessary, with adhesive, in a direction substantially at right angles to the direction of the determined lines, strips, or stripes on the sheet of honeycomb material where bonding of adjacent honeycomb materials is to occur;

(d) the conventional step of stacking adjacent sheets of honeycomb material so their determined lines, strips, or stripes, where bonding is to occur, are offset from sheet to sheet of honeycomb material, the offsetting preferably occurring during the determining of the lines, strips, or stripes on respective adjacent sheets of honeycomb, with this stacking including the pleated strips of heat radiation shielding materials;

(e) the conventional step of pressing together the stacked sheets of honeycomb, utilizing heat when necessary in respect to the bonding specifications, with this pressing including the pleated strips of heat radiation shielding materials; and

(f) the conventional step of pulling apart the then reforming former sheets of honeycomb material transforming them from a non expanded block into an expanded honeycomb material, with this pulling apart including the pleated strips of heat radiation shielding materials.

4,118,264

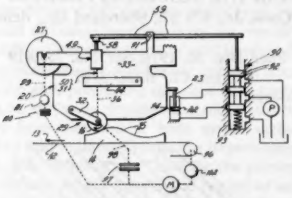
METHOD FOR DRY PRINTING ON CONTOURED WORKPIECES

Carl E. Boettcher, Evansville, Ind., assignor to Automatic Industrial Machines, Inc., Evansville, Ind.

Continuation of Ser. No. 675,908, Apr. 12, 1976, abandoned, which is a division of Ser. No. 576,890, May 12, 1975, Pat. No. 3,975,226. This application Jan. 31, 1977, Ser. No. 764,003

Int. Cl.[2] B44C *1/16;* B32B *1/10*

U.S. Cl. 156—238 **7 Claims**



1. In the process of dry printing onto a workpiece surface which is contoured in the direction of workpiece movement, wherein the workpiece is advanced past a heated applicator roll which rolls a dry printing foil against said surface, said roll being mounted to a carriage which is movable in the direction perpendicular to the direction of workpiece movement, the improvement comprising,

engaging said applicator roll with said foil to roll the foil onto the surface of said workpiece,

applying a predetermined biasing force to said roll by a biasing means connected between said carriage and said roll, said biasing force urging the roll to press the foil against said surface,

advancing the workpiece past the roll while the roll rolls over the countoured surface of the workpiece, the contour of the surface moving the roll relative to the carriage in the direction perpendicular to the direction of workpiece movement, thereby tending to change the force exerted by said biasing means,

sensing such perpendicular movement of the roll relative to the carriage,

and applying the sensed relative roll movement to shift the carriage in the same direction as the sensed movement, by an amount sufficient to restore substantially the same predetermined biasing force on the roll to press said foil against said surface.

4,118,265

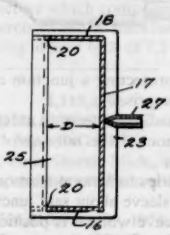
METHOD OF MAKING A BATTERY JAR

James S. Hardigg, Conway, Mass. 01341

Filed Jan. 13, 1976, Ser. No. 648,738

Int. Cl.[2] B29C *5/00;* B29F *1/00*

U.S. Cl. 156—242 **5 Claims**



1. A method of making an elongated battery jar comprising the steps of forming a first open-sided end section member, said end section member being open at the top thereof and having an elongated open side, the distance from said open side to its opposed closed side being at least several times smaller than the distance from top to bottom thereof, said forming step including the step of injecting a plastic material into a mold, said mold defining a plastic material receiving cavity having the shape of said first open-sided end section member and having at least one injection orifice for the ingress of plastic material to said cavity, said at least one injection orifice being positioned along the portion of said cavity defining the opposed closed side of said member, and being substantially symmetrical in a horizontal plane therethrough, forming a second open-sided end section member, heating the surface of said end section members which define the open side thereof, and joining said end section members at their respective heated surfaces to form a battery jar, said jar having a substantially uniform wall thickness from top to bottom thereof.

4,118,266

METHOD FOR FORMING AN IMPROVED INSULATED METAL FRAME

Jack B. Kerr, 1300 Carlisle Pl., Deerfield, Ill. 60015

Filed May 9, 1977, Ser. No. 794,981

Int. Cl.[2] E04B *1/64;* E06B *1/32*

U.S. Cl. 156—293 **3 Claims**

1. The method of forming a metal frame for windows, doors and the like to provide a thermal break between the interior surfaces and the exterior surfaces of said metal frame, said method comprising the steps of:

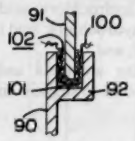
forming an exterior metal strip and an interior metal strip, each of said metal strips terminating in an interconnectable joint portion;

placing a fabric over the joint portions of one of said exterior

metal strip or said interior metal strip to completely cover said joint portion;

joining said exterior metal strip to said interior metal strip by interconnecting said joint portions, thereby forming a spacing between said joint portions;

retaining said fabric intermediate said exterior joint portion and said interior joint portion in said spacing;



filling said spacing with resin, and impregnating said fabric with said resin, and

curing said resin to provide for a metal frame joint which positively spaces said interior metal strip from said exterior metal strip to restrict the conduction of heat in said frame.

4,118,267

SYNTHETIC RESIN FRAMES AND A PROCESS FOR THEIR PRODUCTION

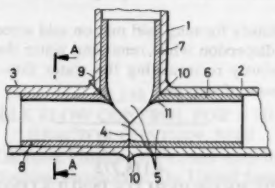
Karl Heinz Vogel, Höhfröschen, Fed. Rep. of Germany, assignor to Gebrüder Kömmerling Kunststoffwerke G.m.b.H., Pirmasens, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,449

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613402

Int. Cl.[2] **B29C** *27/02;* **E04C** *2/38*

U.S. Cl. 156—293 **6 Claims**



1. A process for the production of a reinforced frame for doors, windows and the like, comprising the steps of providing a plurality of tubular frame components of synthetic thermoplastic material, each component having an inner boundary face, and a plurality of reinforcements of synthetic thermoplastic material, each reinforcement having outer boundary face portions and respective end faces; inserting one of said reinforcements into each of said tubular frame components; unitarily bonding at least the greatest part of the outer boundary face portions of each reinforcement into a surface-to-surface engagement with the inner boundary face of each respective frame component so as to prevent potential slippage of said reinforcements and to substantially reinforce each of said tubular frame components; welding the ends of adjacent areas of said tubular frame components together at a first interface; and welding the respective end faces of said reinforcements together at a second interface located in the plane of the first interface.

4,118,268

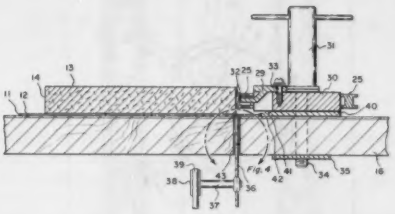
SURFACE AND EDGE LAMINATING APPARATUS

Edwin Price, 9 E. Frambes Ave., Pleasantville, N.J. 08232

Filed Mar. 15, 1977, Ser. No. 777,640

Int. Cl.[2] **B26D** *3/08*

U.S. Cl. 156—510 **8 Claims**



1. An apparatus for scoring the front surface of a surfacing sheet, that is fully coated on its back surface with contact adhesive, that has a substrate panel permanently adhered to the back surface of the sheet, that at least one edge of the substrate panel is covered with contact adhesive, and that the area of the surfacing sheet extends beyond that coated edge of the substrate panel with extension area being at least as large as the coated edge of the panel, comprising:

(a) a structure defining a supporting surface for the surfacing sheet on top of which the substrate panel is adhered,

(b) a fence means positioned at a height over the supporting surface to abut the coated edge of the substrate panel when the surfacing sheet onto which the panel is adhered is placed on the supporting surface,

(c) wherein said fence means extends over the supporting surface providing sufficient space for the surfacing sheet extension under the fence means,

(d) a non-adhering surface face means on the fence means against which the contact adhesive coated edge of the substrate panel slides,

(e) an aperture in the supporting surface,

(f) a scoring means extending upwardly through the aperture under the surface face means capable of cutting a groove at the point under the fence face means in the surfacing sheet as it is moved laterally across the scoring means.

4,118,269

LABELING STATION

Rudolf Zodrow, Düsseldorf, and Egon Höveler, Haan, both of Germany, assignors to Jagenberg-Werke AG, Düsseldorf, Germany

Filed Oct. 17, 1977, Ser. No. 843,097

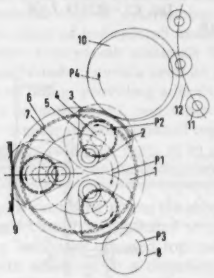
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1976, 2646942

Int. Cl.[2] **B32B** *31/00;* **B65C** *9/08*

U.S. Cl. 156—560 **3 Claims**

1. In a labeling station for applying labels one above the other onto objects, having at least one pickup element mounted eccentrically on a rotatable carrier for movement about an axis, wherein the improvement comprises a gripper cylinder comprising a rotating carrier having eccentrically disposed gripping and pressing elements for the upper and lower labels, which elements are tangent to the circulation path of the pickup elements approximately in synchronism, the labels being transferred by the gripping and pressing elements to objects moved along a transport path, whose areas to be labeled are at different distances from the gripper cylinder axis, wherein the carrier of the gripping and pressing elements comprises two parts disposed one over the other and eccentrically to one another which carry upper and lower gripping and pressing elements at different radii and revolve at equal angu-

lar velocity and wherein circulation paths for the upper and lower gripping and pressing elements have, in the labeling



range, a distance from one another which corresponds to the difference between the areas to be labeled on the objects.

4,118,270

MICRO LENS FORMATION AT OPTICAL FIBER ENDS

Jing Jong Pan; Milton Phillip Arnold, both of Melbourne, and James Castle Barton, Indialantic, all of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Feb. 18, 1976, Ser. No. 658,880
Int. Cl.[2] C03C *25/06, 25/02;* G02B *5/14*
U.S. Cl. 156—659 **6 Claims**

1. The method of forming a lens onto the end of an optical fiber through chemical etching, said optical fiber end having a general contour which is different then the desired lens shape, comprising the steps of:

immersing said fiber end into an etching solution to such an extent that the entire said fiber end is immersed in said etching solution and so that the entire cross-sectional surface of said fiber end is etched by said etching solution,

timing said immersion for an interval being long enough to allow removal of enough of said fiber end by the action of said etching solution alone so that only the desired lens shape remains, and

removing said fiber end from said etching solution at the conclusion of said interval.

6. A method of forming a lens on an optical fiber end comprised of the steps of immersing a selected amount of said fiber end into an optically transparent liquid, withdrawing said fiber end from said liquid so that only a drop of said liquid remains on said fiber end and the surface tension of said drop draws said liquid into the desired lens shape, and hardening said liquid so as to form a solid lens permanently affixed to said fiber end, wherein the resultant lens shape is dependent upon the amount of said fiber immersed in said liquid and wherein said method further comprises the additional step of controlling said selected amount in accordance with the lens shape desired.

4,118,271

METHOD FOR THE PREPARATION OF A PULP

Kyoichi Oku, and Hiroshi Matsuura, both of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 343,452, Mar. 21, 1976, abandoned. This application Aug. 10, 1976, Ser. No. 713,120
Claims priority, application Japan, Mar. 25, 1972, 47-30184; Mar. 25, 1972, Japan 47-30185
Int. Cl.[2] D21C *11/12*
U.S. Cl. 162—31 **7 Claims**

1. A process for the preparation of pulp comprising:

i. mechanically milling a vegetable fibrous material at 50°–250° C. to soften its tissue;

ii. delignifying the milled material by treatment in separate stages with a chlorine-containing compound and ammonia or ammonium hydroxide thereby forming a waste water containing (a) the chlorine-containing compound and (b) ammonia, ammonium hydroxide or an ammonium salt;

iii. separating the delignified fibrous material from said waste liquor;

iv. adding magnesium hydroxide to said waste liquor for reaction with said chlorine-containing compound to form magnesium chloride and to release ammonia for recovery; then

v. burning said waste liquor to decompose said magnesium chloride to hydrogen chloride and magnesium oxide;

vi. absorbing said hydrogen chloride in an aqueous medium for conversion to hydrochloric acid;

vii. converting said hydrochloric acid into said chlorine-containing compound; and

viii. recirculating the ammonia and chlorine-containing compounds recovered in steps iv and vii to the delignifying step ii.

4,118,272

CONTINUOUS WET-LAID PROCESS FOR MAKING HIGH-STRENGTH GLASS FIBER MATS

Bertram Randall Ziegler, Freehold, N.J., and Edward J. Matteson, Hudson Falls, N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Mar. 3, 1977, Ser. No. 773,818
Int. Cl.[2] D21F *11/00*
U.S. Cl. 162—156 **7 Claims**

1. A continuous wet-laid process for making high-strength glass fiber mats consisting essentially of:

a. continuously feeding a known quantity of dry glass fibers of about ¼ inch to 3 inches in length, that is without prior mixing of said fibers in water in tanks, or agitation thereof, directly into an inlet conduit carrying a flowing water stream to form a continuously flowing fiber slurry having a fiber consistency of 0.005 to 0.05% by weight of said fibers in water,

b. continuously pumping said slurry turbulently to form a uniform dispersion said fibers,

c. continuously conveying said dispersion onto a mat-forming screen, said fibers being kept in said water stream enroute to said screen for a minimal period only in order to prevent excessive entangling of said fibers within said stream,

d. continuously forming said mat on said screen from fibers of said dispersion while removing water therefrom, and,

e. continuously recirculating the water thus-removed into said stream of step a).

4,118,273

MANUFACTURE OF PERLITE INSULATING BOARD ON A CYLINDER MACHINE

Gilbert Godin, Lebanon, and Fred C. Norgard, Somerville, both of N.J., assignors to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 259,703, Jun. 5, 1972, abandoned. This application Sep. 20, 1974, Ser. No. 507,640
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—171 **8 Claims**

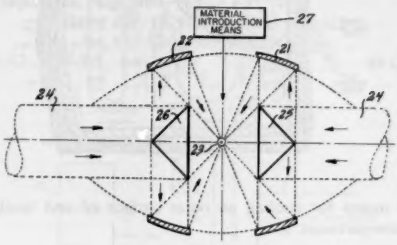
1. An improvement in a process for producing perlite insulating board on a cylinder machine in which an aqueous slurry containing perlite, fiber, and binder is deposited on a rotating cylindrical screen, the improvement comprising: controlling the rate of stock deposition from the slurry by incorporating fine expanded perlite particles having a density of from 4.5–10. lb./cu. ft. in the slurry, with at least about 90% of the perlite particles being able to pass through a 100 mesh screen prior to their expansion, at least 50% by weight of the perlite particles being able to pass a 200 mesh screen prior to their expansion and at least about 20 to 30% by weight of said perlite particles being able to pass a 325 mesh screen after their expansion.

4,118,274

SYSTEM FOR THE PRODUCTION OF PLASMA

George S. Bakken, Ann Arbor, Mich., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 29, 1975, Ser. No. 581,608
Int. Cl.[2] G21B *1/00*
U.S. Cl. 176—1 **11 Claims**



1. A system for the production of a plasma comprising:
(a) a light-focusing member comprising a parabolic axicon with a coaxial conical mirror, the apex of said conical mirror facing away from the focus of said parabolic axicon, said conical mirror being such as to produce a virtual line source along the axis of the cone;
(b) means for introducing a plasma-forming material at the focus of said light-focusing member; and
(c) laser means disposed so as to irradiate such light-focusing member along the axis toward the apex of said conical mirror such that the laser irradiation is concentrated at the focus of the parabolic axicon of the focusing member and impinges upon said plasma-forming material so as to produce a plasma.

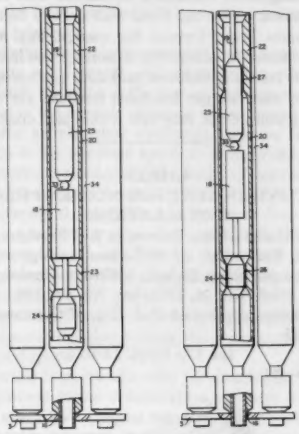
4,118,275

VARIABLE FLOW CONTROL FOR A NUCLEAR REACTOR CONTROL ROD

Richard D. Carleton, Pittsburgh, Pa., and Ajay Bhattacharyya, Vasteras, Sweden, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 283,260, Aug. 23, 1972. This application Dec. 12, 1974, Ser. No. 532,285
Int. Cl.[2] G21C *7/08*
U.S. Cl. 176—36 R **7 Claims**

1. In a nuclear reactor, said reactor comprising a nuclear core having openings therein, a plurality of control rod assemblies, each control rod assembly being positioned and movable into and out a respective opening in said nuclear core, said control rod assembly comprising a control rod containing neutron absorbing material, a drive shaft attached thereto for driving said control rod into and out of said opening in said nuclear core, said reactor further comprising a plurality of housings, each being respectively positioned in said opening and enclosing said control rod assembly therein, means for circulating a reactor coolant through said housings to remove heat generated within said control rods, and means for varying said reactor coolant flow rate through said housings in accordance with the position of said control rods relative to said nuclear core comprising means forming at least one flow restriction located within each of said housings, said flow restrictions having a resistance which varies in relation to said control rod motion.

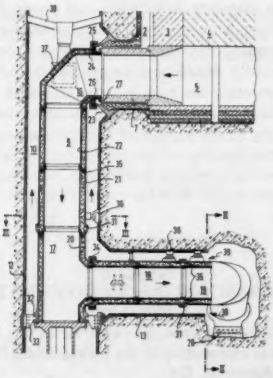


4,118,276

CONDUIT SYSTEM FOR GASES OF HIGH TEMPERATURE AND HIGH PRESSURE

Alija Hodzic; Dirk Haferkamp, both of Mannheim; Heinrich Stach, Ilvesheim, and Eike Pfietz, Ludwigshafen, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 605,000, Aug. 15, 1975, abandoned. This application Jun. 10, 1977, Ser. No. 805,510
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1974, 2439224
Int. Cl.[2] G21C *3/56*
U.S. Cl. 176—60 **11 Claims**



1. In a high temperature power plant construction including a plurality of plant components comprising at least one gas-cooled nuclear reactor, contained in a pre-stressed concrete pressure vessel surrounding the reactor core, and a transport system for gas of high temperature and high pressure, connecting said plant components and being contained in said pre-stressed concrete pressure vessel, the improvement which comprises said gas transport system comprising a plurality of internally insulated hot gas transport conduits formed from a plurality of separate sections, means for flow connecting said

conduits, a pressure jacket surrounding each of said hot gas transport conduits, a corresponding plurality of closed channels comprising bores contained within the wall of said prestressed concrete vessel and lined with steel or concrete, said closed channels being formed for transporting a cool gas stream, and means for removably mounting said hot gas transport conduits coaxially inside of said cool gas transport channels whereby said hot gas transport conduits are removably mounted at a plurality of intervals within said channels.

4,118,277

STEEL CONTAINMENT FOR NUCLEAR REACTOR INSTALLATIONS

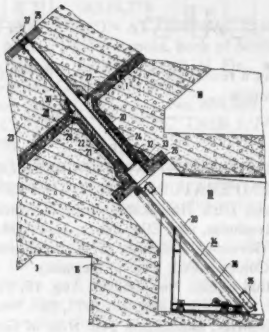
Hans-Peter Schabert; Hans Bremer, both of Erlangen, and Erich Strickroth, Buckenhof, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Germany

Filed Nov. 16, 1976, Ser. No. 742,196

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1975, 2551595

Int. Cl.[2] G21C *13/02*

U.S. Cl. 176—87 **15 Claims**



1. In an assembly of a closed steel containment vessel and a concrete foundation, the containment vessel being partly seated on the concrete foundation and partly free-standing, built-in structures being received in the containment vessel and pipelines extending through the containment vessel, a multiplicity of linearly distributed elongated threaded clamping members connecting the built-in structures with the concrete foundation, said threaded clamping members being oriented perpendicularly to the surface of the containment vessel, and resilient packing spacing at least part of said threaded clamping members from the concrete foundation, said resilient packing having a length shorter than the length of said threaded clamping members.

4,118,278

NUCLEAR REACTOR INSULATION AND PREHEAT SYSTEM

Nevin C. Wampole, Latrobe, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 27, 1976, Ser. No. 727,081

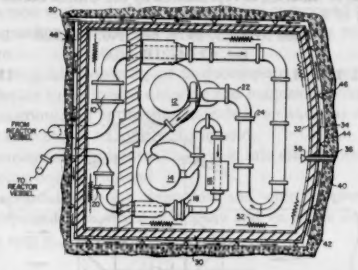
Int. Cl.[2] G21C *13/10*

U.S. Cl. 176—87 **7 Claims**

1. In a nuclear reactor having components for circulating a liquid coolant, an insulation and preheat system comprising:

(a) a fluid tight compartment of thermal insulation surrounding preselected portions of said components and spaced therefrom an extended distance so as to facilitate visual inspection;

(b) a supplemental heating device disposed within said compartment for heating the internal atmosphere of said compartment so that said preselected components are substantially evenly heated; and



(c) means for cooling an outer surface of said insulated compartment.

4,118,279

STABILIZING AGENT FOR ENZYMES

Helmut Determann, Starnberg; Erich Bernt, Munich; Werner Dollacker, Weilheim, all of Germany; Ingeborg Gutmann, deceased, late of Bad Heilbrunn, Germany (by Siegfried Gutmann, administrator), and by Gudrun Engelhardt, administrator, Saarbruecken, Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed Oct. 18, 1977, Ser. No. 843,298

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648759

Int. Cl.[2] C07G *7/02*

U.S. Cl. 195—63 **4 Claims**

1. An enzyme preparation containing oxypolygelatine as a stabilizing agent.

4,118,280

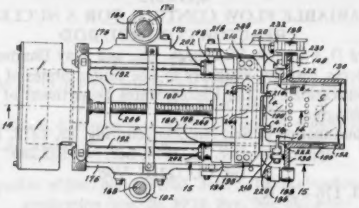
AUTOMATED MICROBIAL ANALYZER

Ronald A. Charles, St. Louis County; Paul W. Jones, St. Charles; John L. Staples, Florissant, and Joseph R. Wiegner, Ballwin, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 3, 1976, Ser. No. 682,664

Int. Cl.[2] C12K *1/04*

U.S. Cl. 195—127 **40 Claims**



1. A machine for examining cards which are normally stored in a card holder and have viewing wells therein; said machine comprising: a mounting element; a card holder positioned adjacent to the mounting element, said card holder being capable of holding a plurality of cards therein with the cards being presented to the mounting element; extracting means on the mounting element aligned with the card holder for gripping the cards individually and withdrawing them from the card holder; light emitting means on the mounting element for projecting light through the wells when the cards are withdrawn from the card holder; light detecting means on the mounting element for determining the intensity of light passing

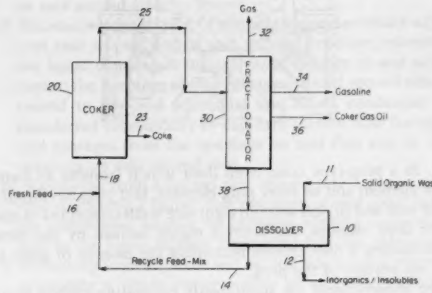
through the wells; and means for aligning the wells in the cards in registry with the light emitting means and with the light detecting means.

4,118,281

CONVERSION OF SOLID WASTES TO FUEL COKE AND GASOLINE/LIGHT OIL

Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 15, 1977, Ser. No. 788,063
Int. Cl.² C10B *57/04*; C10G *1/04*
U.S. Cl. 201—2.5 **15 Claims**



1. A conversion process for the disposal of solid organic wastes which comprises:

a. slurrying solid organic wastes in coker feed selected from the group consisting of coker petroleum feed stocks, coker recycle feed, and combinations thereof, wherein the weight ratio of solid organic waste to coker feed is within the range from 0.1 to 0.5;

b. heating the slurry at a temperature within the range from about 300° to 1000° F. for a period of time sufficient to convert the slurry into a pitch-like composition;

c. coking the pitch-like composition at a temperature within the range from about 800° to 1000° F.; and

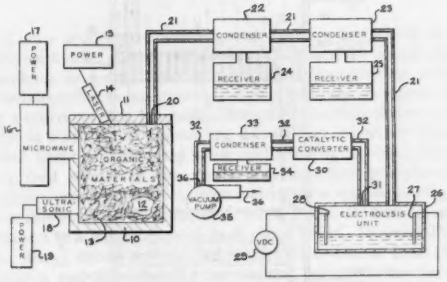
d. recovering gas, oil, and coke products.

4,118,282

PROCESS AND APPARATUS FOR THE DESTRUCTIVE DISTILLATION OF HIGH MOLECULAR WEIGHT ORGANIC MATERIALS

Floyd D. Wallace, Leslie, Mich., assignor to Wallace Energy Conversion, Inc., Charlotte, Mich.

Filed Aug. 15, 1977, Ser. No. 824,559
Int. Cl.² C10J *3/00*; C10B *7/08*; C07C *15/10*; C10B *57/02*
U.S. Cl. 201—2.5 **22 Claims**



1. The process for the destructive distillation of high molecular weight organic materials to produce volatilization products which comprises:

(a) providing high molecular weight organic materials in a confined space irradiatable by multiple wave energy sources including microwave and ultrasonic generators as the wave energy sources and with a conduit connected to an outlet from the confined space for removal of volatilization products;

(b) irradiating the organic materials simultaneously with the multiple wave energy sources including microwave and ultrasonic radiation in the presence of separated elemental carbon in the organic materials in an amount sufficient to produce an electrical discharge between the separated carbon in the confined space so as to produce volatilization products including carbon soot by destructive distillation of the organic materials; and

(c) recovering the volatilization products from the conduit and a carbonized residue from the confined space.

14. An apparatus useful for the destructive distillation of high molecular weight organic materials into gaseous volatilization products which comprises:

(a) a chamber defining a confined space including a cover for introducing and then sealing the organic materials in the confined space;

(b) an outlet from the chamber for attachment of a conduit for removal of the volatilization products from the confined space, said conduit being provided with condensers for recovering some of the volatilization products as liquids, with means for removing carbon soot and with means for removal and recovery of gaseous volatilization products which are uncondensed;

(c) means located at an outlet from said conduit for reducing the pressure in the confined space; and

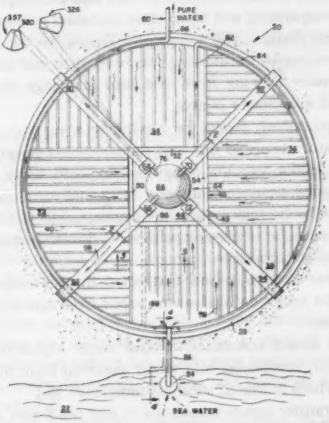
(d) generating means in association with the chamber for providing wave energy in the confined space including ultrasonic and microwave generators, wherein the simultaneously produced combined wave energy of the ultrasonic and microwave generators is sufficient to produce destructive distillation of the organic materials in the presence of separated elemental carbon in the organic materials in an amount sufficient to produce an electrical discharge between the separated carbon and to produce volatilization products including carbon soot.

4,118,283

APPARATUS FOR DESALINATING WATER

Richard E. Diggs, 12A Rd., Carthage, Mo. 64836

Filed Oct. 28, 1975, Ser. No. 625,850
Int. Cl.² B01D *3/00*
U.S. Cl. 202—160 **14 Claims**



1. A distillation device comprising:

a first water transfer means for withdrawing contaminated water from a body of water having solid contaminants dissolved therein;

a grid connected to said first water transfer means so that contaminated water received from said body of water flows across said grid, said grid having an outer peripheral edge and an inner peripheral edge and comprising a header located on said grid outer peripheral edge and fluidly connected to said first water transfer means so that contaminated water flows into said header from the body of water, said header being fluidly attached to said grid so that contaminated water flows from said header onto said grid whereby contaminated water flows from the body of water to said grid via said header, and a trough located on said grid inner peripheral edge and fluidly attached to said grid so that contaminated water flows into said trough from said grid, and means for transferring solar energy to said water flowing across said grid;

a water storage means having a side wall attached to said grid trough so that contaminated water flowing on said grid flows into said water storage means via said trough;

second water transfer means connected with said water storage means for removing contaminated water from said storage means;

a third water transfer means located in said trough and connected to said water storage means for transferring water from said trough to said water storage means and temperature control means connected to said third water transfer means for actuating said third water transfer means when the temperature of said water in said trough reaches or exceeds said predetermined temperature so that only water having a temperature which equals or exceeds said predetermined temperature is transferred to said water storage means;

a heat exchange structure connected to said water storage means;

a recirculation apparatus mounted in said trough and connected to said header for recirculating said water from said trough back to said header prior to transferring water from said trough into said water storage means and temperature control means connected to said recirculation apparatus for actuating said apparatus when the temperature of said water in said trough falls below a predetermined temperature;

an evaporator means connected to said heat exchange structure for separating said water from said solid contaminants dissolved therein, said evaporator means having a solar heater means for transferring solar energy to said contaminated water flowing from said heat exchange structure into said evaporator means;

vacuum producing means for producing a vacuum in said evaporator means so that said contaminated water is vaporized under vacuum conditions to form water vapor and thereby separate said water from said solid contaminants, and solid removing means connected to said evaporator means for removing said solid contaminants from said evaporator means;

water vapor transfer means connected to said evaporator means for removing said water vapor from said evaporator means;

condenser means connected to said water vapor transfer means for condensing said water vapor to form distilled water which is free of solid contaminants; and

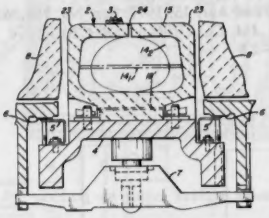
distillate transfer means connected to said condenser means for withdrawing condensed water from said condenser means.

4,118,284

PLUG-TYPE COKE OVEN DOOR

Walter A. Bowman, Pleasant Hills Borough, and Richard L. Wessel, Plum Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 31, 1977, Ser. No. 847,198
Int. Cl.[2] C10B *25/06*
U.S. Cl. 202—248 **4 Claims**



1. In a plug-type coke oven door which includes an outer door element and an inner plug element, said plug having (i) a front wall and (ii) left and (iii) right side walls connected to said outer door element, the interior region defined by the three walls having a duct therein permitting the passage of gases to the top portion of the plug,

the improvement for significantly decreasing carbon accumulation within said duct and on the exterior surfaces of the left and right side walls, in which (a) essentially the entire cross-sectional thickness of said three walls is less than three inches, and are sufficiently thin to provide a thermal conductivity of at least 0.3 Btu/(hour) (sq.ft.) (°F/ft.) and (b) the left and right side walls have a width of at least 8 inches, said width being more than one half the depth of the plug,

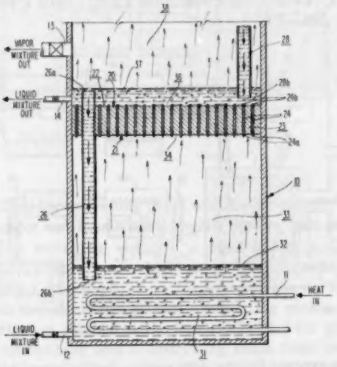
the interior of said duct being substantially unobstructed, in order that heat entering therein, primarily through the exterior face of said front wall, may readily be transferred to the interior faces of said left and right side walls and, in turn, to the outer faces thereof.

4,118,285

SEPARATION OF LIQUID MIXTURES

George Chiayou Yeh, Newtown Sq., Pa., assignor to Villanova University, Villanova, Pa.

Filed Apr. 29, 1975, Ser. No. 572,881
Int. Cl.[2] B01D *3/14*
U.S. Cl. 203—81 **13 Claims**



1. Method for separating a mixture of at least two liquids of differing volatilities, said method comprising:

A. Boiling said liquid mixture to form a vapor mixture comprising a more volatile component and a less volatile component;

B. Subjecting said vapor mixture to contact under condensing conditions with a first side of a porous structure having passages extending between openings on said first side and openings on a second side of said structure, said passages being adapted to permit said vapor mixture in condensed liquid state to flow therethrough substantially by capillary suction flow, whereby said vapor mixture is condensed at least in part and substantially in and adjacent to the openings on said first side and is caused to flow in condensed liquid state and substantially in the absence of vapor from the openings on said first side to the openings on said second side;

C. Maintaining conditions of temperature and pressure adjacent said second side of said porous structure, whereby the liquid condensate of said vapor mixture in and adjacent to the openings of said passages on said second side is caused to boil and additional said liquid condensate is transferred substantially by capillary suction flow through said passages from the openings on said first side to the openings on said second side;

D. Removing from adjacent said second side a vapor mixture containing a higher concentration of said more volatile component relative to said less volatile component than in the vapor mixture contacting said first side; and

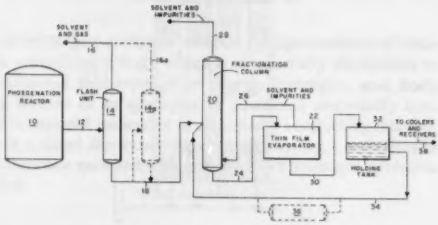
E. Removing from adjacent said second side a liquid mixture containing a lower concentration of said more volatile component relative to said less volatile component than in the vapor mixture contacting said first side.

4,118,286

PROCESS FOR REDUCING THE ACIDITY OF ORGANIC POLYMERIC ISOCYANATES

Simor Pierce Burns, and John Monte Walton, both of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

Filed Sep. 25, 1974, Ser. No. 508,984
Int. Cl.[2] B01D *3/00*
U.S. Cl. 203—89 **4 Claims**



1. In a process for purifying and reducing the acidity of a polymethylene polyphenylpolyisocyanate mixture comprising distilling, in a distillation step, a crude polymethylene polyphenylpolyisocyanate mixture resulting from the phosgenation of a corresponding polymethylene polyphenylpolyamine mixture in a solvent to remove the solvent and impurities therefrom, said distillation step being conducted by passing a flowing feed stream of the crude polymethylene polyphenylpolyisocyanate mixture through a distillation column having a thin film evaporator means mounted therewith for heating said mixture to a temperature of from about 190° C. to about 250° C., taking excess solvent and impurities overhead from the column, and then allowing the resulting polymethylene polyphenylpolyisocyanate distillation residue from the column and evaporator means to cool, the improvement which comprises:

maintaining the polymethylene polyphenylpolyisocyanate residue from the column and evaporator means at a temperature of from about 190° C. to about 250° C. for about 1 to about 60 minutes; and

recirculating continuously a portion of said residue being maintained at said temperature for said time to said distillation column for admixture with said flowing feed stream of crude polymethylene polyphenylpolyisocyanate mixture, whereby the acidity content of the polymethylene polyphenylpolyisocyanate mixture is substantially reduced.

4,118,287

METHOD FOR MAKING A METAL MASTER FOR PRODUCING A GRAMOPHONE RECORD

Léon Dewallens, Louvain, Belgium, assignor to Fabrication Belge de Disques "Fabeldis", Molenbeek-Saint-Jean, Belgium

Filed May 2, 1977, Ser. No. 792,989
Claims priority, application Belgium, Jul. 8, 1976, 168739
Int. Cl.[2] B29C *24/00, 25/00*
U.S. Cl. 204—6 **6 Claims**

1. A method of making a metal molding die for producing in a pressure press gramophone records of plastic material provided with visual information in the center thereof, comprising the steps of:

providing a non-conductive support adapted to have grooves containing audio information in the annular portion thereof;

etching labeling information in a separate film layer;

fastening said film bearing said labeling information onto the central circular portion of said non-conductive support; and

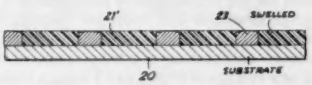
galvanically plating metal on said non-conductive support and said film and stripping said metal to produce an integral and unitary molding die having a negative configuration to said non-conductive support at both the central portion bearing labeling information and the annular portion bearing audio information.

4,118,288

METHOD OF PRODUCING A PERFORATED METAL FOIL, ESPECIALLY FOR SCREEN PRINTING

Siegfried Rückl, Kufstein, Austria, assignor to Schablonentechnik Kufstein GmbH, Kufstein, Austria

Filed Mar. 24, 1977, Ser. No. 781,063
Claims priority, application Austria, Mar. 29, 1976, 2283/76
Int. Cl.[2] C25D *1/08, 1/20*
U.S. Cl. 204—11 **15 Claims**



1. A process for producing a coherent perforated metal foil which comprises the steps of:

applying a photosensitive layer to a metallic substrate;

selectively exposing said photosensitive layer to luminous energy through an optical mask;

developing the exposed photosensitive layer to leave isolated portions of photosensitive material, corresponding to the perforation to be formed in said foil, on said substrate;

increasing the porosity of said isolated portions;

swelling said isolated portions by contacting same with moisture to reduce the intervening interstices;

galvanically depositing metal on said substrate in said interstices; and

separating the resulting metallic structure from said substrate and from said isolated portions.

4,118,289

TIN/LEAD PLATING BATH AND METHOD

Grace F. Hsu, Somers, Conn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 374,643, Jun. 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 83,229, Oct. 22, 1970, Pat. No. 3,785,939. This application Jan. 3, 1978, Ser. No. 866,537

Int. Cl.[2] C25D *3/56, 3/60*

U.S. Cl. 204—43 S **18 Claims**

1. An aqueous acid plating bath for electrodeposition of tin/lead alloys comprising about 5.0 to 80.0 grams per liter of stannous ion; about 85.0 to 10.0 grams per liter of lead ion; at least about 100.0 grams per liter of a radical selected from the group consisting of fluoborate, fluosilicate and sulfamate; and, as a brightener system, at least about 5.0 grams per liter of a nonionic polyoxyalkylated surfactant, at least about 4.0 grams per liter of a lower aliphatic aldehyde containing 1 to 4 carbon atoms, at least about 2.0 grams per liter of an amine, at least about 0.3 grams per liter of a polyhalogenated benzene compound and at least about 0.25 gram per liter of a brightener selected from the group consisting of heterocyclic carboxaldehydes, aromatic ketones and aromatic carboxylic acids and mixtures thereof, said bath having a pH of less than about 3.0.

14. An aqueous acid plating bath for electrodeposition of tin/lead alloys comprising about 5.0 to 80.0 grams per liter of stannous ion; about 85.0 to 10.0 grams per liter of lead ion; at least about 100.0 grams per liter of a radical selected from the group consisting of fluoborate, fluosilicate and sulfamate; and, as a brightener system, at least about 5.0 grams per liter of a nonionic polyoxyalkylated surfactant, at least about 4.0 grams per liter of a lower aliphatic aldehyde containing 1 to 4 carbon atoms, at least about 2.0 grams per liter of at least one aliphatic amine and at least about 0.25 gram per liter of a brightener selected from the group consisting of heterocyclic carboxaldehydes, aromatic ketones and mixtures thereof, said bath having a pH of less than about 3.0.

4,118,290

PROCESS FOR THE PREPARATION OF PERFLUOROETHYL IODIDE

Hans-Joachim Semmler, Hochheim, Main, and Bernd Felix, Burghausen, Salzach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 9, 1977, Ser. No. 775,847

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610148

Int. Cl.[2] C25B *3/08;* **C07C** *17/10*

U.S. Cl. 204—59 F **6 Claims**

1. Process for the preparation of perfluoroethyl iodide from tetrafluoro-diiodoethane and hydrogen fluoride, which comprises electrolyzing a mixture of anhydrous hydrofluoric acid and tetrafluoro-diiodoethane at a temperature of from −15° C to +19° C at a voltage of from 3 to 8.5 using a nickel anode and recovering the formed perfluoroethyl iodide.

4,118,291

METHOD OF ELECTROWINNING TITANIUM

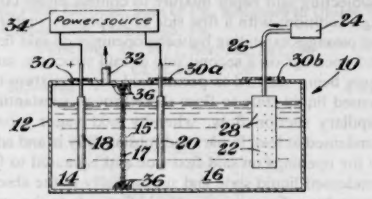
Paul R. Juckniess, and David R. Johnson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 517,569, Oct. 24, 1974, abandoned. This application Sep. 13, 1976, Ser. No. 722,850

Int. Cl.[2] C25C *3/28, 7/04*

U.S. Cl. 204—64 T **37 Claims**

1. A method to produce metallic titanium in an electrolytic cell having an anode, a cathode and a feed means comprising: inserting a foraminous diaphragm coated with a metal resistant to the environment within the cell into the cell to space apart an anode compartment from a cathode compartment, the diaphragm having a diaphragm coefficient of greater than zero to about 0.5 and a flow coefficient within the range of from about 0.1 to about 25; introducing an ionizable titanium compound into a molten salt bath contained in the cathode compartment;



and impressing an electromotive force between the anode and the cathode to form a gas at the anode and to deposit metallic titanium on the cathode.

4,118,292

PACKED BED ELECTROREFINING AND ELECTROLYSIS

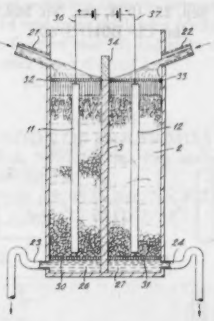
Derek John Fray, Trumpington, and James Henry Cleland, Cambridge, both of England, assignors to National Research Development Corporation, London, England

Filed Jun. 8, 1977, Ser. No. 804,807

Claims priority, application United Kingdom, Jun. 9, 1976, 23894/76; Nov. 5, 1976, 46171/76

Int. Cl.[2] C25C *3/00, 3/34, 3/06*

U.S. Cl. 204—67 **9 Claims**



1. A method of refining a molten metal comprising the steps of:

providing an anode assembly comprising a bed of conductive particles in a salt which is in a molten condition,

separating the anode assembly from a cathode assembly by a diaphragm pervious to the salt and impervious to the molten metal,

providing the cathode assembly, which comprises a bed of conductive particles in a salt which is in a molten condition,

passing a stream of the molten metal to be refined into the anode assembly,

applying a voltage between the bed of the anode assembly and the bed of the cathode assembly, and

withdrawing refined molten metal from a sump region of the cathode assembly.

4,118,293

PROCESS FOR PRODUCING TIN (II) SULFATE

Erich Ruf, and Hans Loges, both of Essen, Germany, assignors to Th. Goldschmidt AG, Essen, Germany

Filed Jan. 14, 1977, Ser. No. 759,396

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1976, 2602031

Int. Cl.[2] C25B *1/00*

U.S. Cl. 204—93 3 Claims

1. In an electrolytic process for producing tin(II) sulfate by dissolving tin anodically in a sulfuric acid solution in which the anode space is separated from the cathode space by a diaphragm or by a space limited by diaphragms, the improvement which comprises said diaphragm being a sintered diaphragm composed of inorganic, ceramic materials which have been sintered at above 1000° C., said diaphragms having wall thicknesses in excess of 5 mm, pore widths smaller than 2 μm and a pore volume greater than 45%.

4,118,294

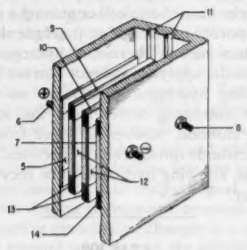
NOVEL CATHODE AND BIPOLAR ELECTRODE INCORPORATING THE SAME

Alberto Pellegri, Luino (Va), Italy, assignor to Diamond Shamrock Technologies S. A., Geneva, Switzerland

Filed Sep. 19, 1977, Ser. No. 834,418

Int. Cl.[2] C25B *1/02, 11/04, 11/08*

U.S. Cl. 204—129 20 Claims



1. A hydrogen-evolution cathode for electrochemical reactions, comprising a body which is substantially impervious to the diffusion therethrough of atomic hydrogen, said body being formed of an aggregate of powdered electrically conductive material embedded in electrically conducting relationship in a cured thermosetting resin and having a cathodically active surface enriched with a powder of a hydrogen evolution catalyst.

4,118,295

REGENERATION OF PLASTIC ETCHANTS

Theodore Frank Korenowski, Zelienople, and Leslie Emery Lancy, Ellwood City, both of Pa., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Apr. 20, 1976, Ser. No. 676,941

Int. Cl.[2] C02C *5/12*

U.S. Cl. 204—151 10 Claims

1. In a plastic etching process wherein plastic workpieces are subjected to etching by a chromic acid-sulfuric acid etchant solution in an etch zone and then rinsed with water in a rinse zone, and wherein during the course of the process the etchant solution and the rinse water become spent, the spent etchant being depleted in hexavalent chromium, enriched in trivalent chromium and contaminated with plastic organic breakdown products, the spent rinse water being enriched with such spent etchant, the method of at least partially removing such organic breakdown products from the spent etchant, while regenerating etchant for reuse within the plastic etching process, which method comprises:

withdrawing spent etchant from the etch zone and spent rinse water from the rinse zone;

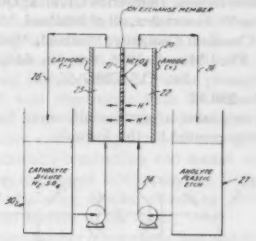
diluting spent etchant with spent rinse water;

heating the diluted spent etchant to at least about 60° C.;

passing said heated diluted etchant solution into the anode chamber of an electrolytic cell, which contains a permselective ion exchange membrane which divides the cell into said anode chamber and a cathode chamber;

maintaining an aqueous sulfuric acid solution in the cathode chamber;

electrically energizing the solutions in the anode and cathode chambers by cooperating anode and cathode means;



oxidizing plastic organic breakdown products in said anode chamber at a temperature of at least 60° C. while preventing transfer of anions to the cathode chamber;

withdrawing a chromic acid-sulfuric acid solution, which is depleted in organic content and enriched in hexavalent chromium, from the anode chamber into an evaporation zone;

increasing the temperature of said chromic acid-sulfur acid solution in the evaporation zone to remove additional quantities of organic breakdown products, to evaporate water from said solution and to recover a reconcentrated regenerated chromic acid-sulfuric acid solution, and passing said concentrated solution to the etch zone.

4,118,296

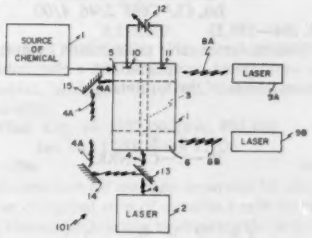
METHOD FOR MASS SEPARATION OF A GASEOUS MIXTURE

Fritz S. Klein, Rehovot, Israel, and John Ross, Lexington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 7, 1976, Ser. No. 730,550

Int. Cl.[2] B01J *1/10;* B01D *59/16, 59/34*

U.S. Cl. 204—157.1 R 7 Claims



1. A method of separation of mixed isotopic gas species of different masses by enriching the concentration of at least one said isotopic species in a static fluid mixture, which comprises:

(a) placing the fluid mixture in a chamber;

(b) subjecting the mixture to a macroscopic process in which a laser beam is directed therethrough to effect an initial enriched concentration of said one isotopic species by

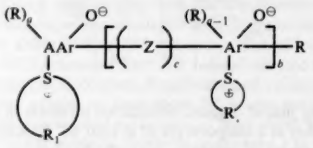
thermal diffusion wherein concentration and separation is thus effected by respective differences in temperature produced in the mixture by laser irradiation;
(c) permitting the said one thus enriched species to collect in a given region of said chamber;
(d) acting upon said one species to change its nature rendering it responsive to removal from said chamber;
(e) removing said one species from the chamber.

4,118,297
FUSED POLY-NUCLEAR AROMATIC CYCLIC SULFONIUM ZWITTERIONS AND POLYMERS THEREOF

William E. Broxterman; Demetrius Urchick; Donald L. Schmidt, and Clayton W. Hoornstra, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 8, 1976, Ser. No. 664,791
Int. Cl.[2] C08G *65/44*
U.S. Cl. 204—159.11 **18 Claims**

1. A polymerizable ar-cyclic sulfonium, fused polynuclear areneoxide represented by the formula:



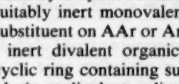
wherein AAr is a fused cyclic polynuclear aromatic polyyl, each Ar is independently a cyclic aromatic polyyl, each R is independently a suitably inert monovalent radical capable of existing as a ring substituent on AAr or Ar, each R_1 is independently a suitably inert divalent organic radical capable of forming a heterocyclic ring containing sulfur, each Z is independently a suitably inert divalent radical bridging AAr and Ar, each *a* is independently a positive number corresponding to the number of remaining available ring positions on AAr or Ar, *b* is 0 or a positive number and *c* is 0 or 1, said polynuclear areneoxide capable of polymerizing upon exposure to radiative energy at a rate faster than the rate of polymerization of a similar mononuclear areneoxide having only mononuclear aromatic polyyl(s).

4,118,298
PHOTOPOLYMERIZABLE ARYL AND HETEROCYCLIC GLYOXYLAMIDE COMPOSITIONS

Francis A. Via, Yorktown Heights, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

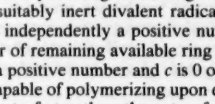
Filed Apr. 15, 1977, Ser. No. 787,827
Int. Cl.[2] C08F *2/46, 4/00*
U.S. Cl. 204—159.23 **30 Claims**

1. A photopolymerizable composition comprising an ethylenically unsaturated compound and a photoinitiating amount of a glyoxylamide of the formula:



I

or



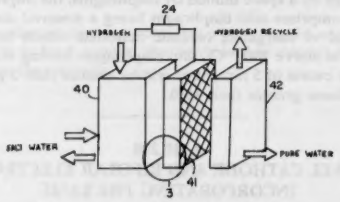
II

wherein R and R^1 are individually selected hydrogen or hydrocarbon of from 1 to 10 carbon atoms; R^2 is a heterocyclic radical, aryl of from 6 to 14 carbon atoms or mono-, di- or polysubstituted phenyl with substituents selected from the group consisting of alkyl, alkoxy, aryloxy, alkylthio, arylthio and halogen; R^3 is phenyl or $-(CH_2)_z$ where z is an integer from 2 to 6; X is zero, oxygen, sulfur, —NH—, phosphorus or silicon; and *n* is an integer from 1 to 4.

4,118,299
ELECTROCHEMICAL WATER DESALINATION PROCESS

Henri Jean Robert Maget, 80 Arbuelo Way, Los Altos, Calif. 94022

Filed Jul. 14, 1977, Ser. No. 815,663
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—180 P **5 Claims**

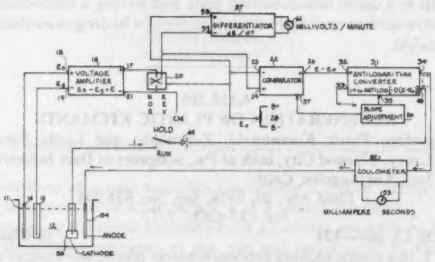


1. A process for removing water from an aqueous solution which comprises: treating the aqueous solution stream with hydrogen to cause hydrogen mixing with the aqueous solution, electrochemically treating the aqueous solution-hydrogen mixture in an electro-osmotic cell contaning a cation exchange membrane or porous diaphragm to preclude short circuits and reaction product mixing therein, a hydrogen anode and a hydrogen cathode, applying a direct current potential across said cell causing hydrogen to undergo an oxido-reduction process while entraining water from the aqueous solution stream to the cathode, recovering water from hydrogen released at said cathode through electrochemical hydrogen compression means, allowing hydrogen to be recycled and recovering the water.

4,118,300
COULOMETRIC TITRATOR

Joe M. Victor, and James Dougherty, both of Houston, Tex., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Jun. 28, 1977, Ser. No. 810,834
Int. Cl.[2] G01N *27/44*
U.S. Cl. 204—195 T **9 Claims**



1. A coulometric titrator for determining the amount of a specific ion in a sample solution by the reaction with a reactive ion comprising:
(a) a cell for containing said sample solution and including electrodes for immersion in said solution, said electrodes including a reference electrode providing a first signal voltage and a specific ion sensing electrode providing a second signal voltage representing the logarithm of the concentration of the specific ion in said sample solution;
(b) differential input amplifier means having as inputs said

first and second signal voltages from said reference and specific ion sensing electrodes and said differential input amplifier having as its output an error signal voltage representing the difference between said first and second signal voltages;

(c) reversing switch means receiving as input said error signal voltage and providing as output said error signal voltage in either the positive or negative sense depending on the position of said switch;

(d) reference means providing a reference voltage for the specific ion in the solution indicative of a particular rate of change of the second signal voltage while said rate of change of the second signal voltage is constant;

(e) comparator means receiving as inputs the signal voltage from said reversing switch and said reference voltage and providing as its output a sensor signal voltage representing the difference between said error signal and reference voltages;

(f) antilogarithm converter means receiving said sensor signal voltage and having an output signal that is a function of the antilogarithm of said sensor signal voltage, said function being represented by the equation:

$$i = i_o \text{antilog } [[-D(E-E_o)]] \ (-D(E-E_o)),$$

where

i = output signal current

i_o = referencing current

$E-E_o$ = sensor signal voltage

D = slope of the function plotted on semi-logarithmic paper;

(g) means for adjusting said slope D, said means adapted to give slopes ranging from 0.020 to 0.059; and

(h) reactive ion source means in the sample solution receiving said output signal and associated with a current source providing an unidirectional current flow between an anode and a cathode immersed in the sample solution and said reactive ion source means is either the anode or the cathode with the other being inert and with the quantum rate of reactive ion introduction into the sample solution being proportional to said output signal, whereby said second signal voltage changes at a constant rate with time and said reactive ion addition changes in a logarithmically decreasing amount with time in the sample solution until the stoichiometric end point is approached.

4,118,301

APPARATUS FOR ELECTROCHEMICAL FINISHING OF STAINLESS STEEL

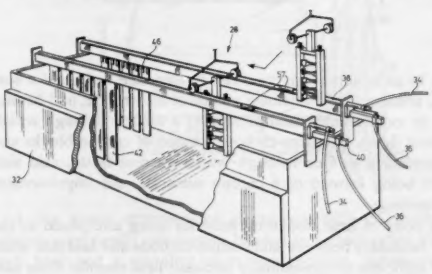
Peter Mayer, Burlington; Robert W. Blair, Perth, and Mohammed Zamin, Mississauga, all of Canada, assignors to Heritage Silversmiths Limited, Perth, Canada

Filed Jul. 8, 1977, Ser. No. 814,271

Claims priority, application United Kingdom, Jul. 20, 1976, 30223/76

Int. Cl.[2] C25D *17/06, 17/08*

U.S. Cl. 204—202 **7 Claims**



1. An electropolishing apparatus, comprising

an elongate electropolishing tank having an open top and adapted to hold a bath of electrolyte,

a plurality of generally planar upright rack means adapted to support a plurality of stainless steel items to be polished and suspended in generally planar alignment from overhead track means extending longitudinally of the tank,

said track means including a downwardly-sloping portion at the inlet end of said tank for immersion of said plurality of rack means successively into said tank, a generally-horizontal portion between the inlet end and outlet end of said tank for conveying said successively-immersed racks through said tank and an upwardly-sloping portion at the outlet end of said tank for removal of said plurality of rack means successively from said tank,

anode means operatively electrically connected through said rack means to said stainless steel items to render the same anodic during said electropolishing, and

cathode means arranged to be operatively electrically connected to said electrolyte bath for the passage of electricity through said electrolyte bath between said anodic stainless steel items and said cathode means,

said anode means comprising first and second horizontally-spaced electrically-conducting rod means each mounted in an upper surface of corresponding first and second electrically-insulating blocks extending above the tank from one end thereof to the other,

said anode means further comprising first and second electrically-conducting roller means rotatably mounted on opposite ends of an electrically-conducting rod extending transversely of said tank, said roller means being adapted to roll one on each said rod means, said transverse rod being joined to hanger and frame means suspending the same from said track means, the remainder of said rack means being suspended from said transverse rod,

each of said anode rod means having a portion thereof electrically insulated adjacent said downwardly-sloping portion of said track means for engagement with said roller means of each successive rack means as said rack means enters said tank to electrically insulate each said anode rod from the respective roller means during initial contact of said roller means and rod means and thereby inhibit arcing,

said cathode means comprising first and second horizontally-spaced electrically-conducting bar means each mounted in a lower surface of the corresponding first and second electrically-insulating blocks,

said cathode means further comprising a plurality of closely-spaced rectangular cathode plates suspended from and in electrical contact with said bar means and extending vertically downwardly into said electrolyte bath to a depth at least equal to that of the lower end of each of said rack means.

4,118,302

CATHODE STRUCTURE FOR USE IN ELECTROLYTIC PROCESS

Robert R. Gobert, Michigan City, Ind., assignor to National Steel Corporation

Filed Aug. 10, 1977, Ser. No. 823,441

Int. Cl.[2] C25B *9/00, 17/00*

U.S. Cl. 204—206 **20 Claims**

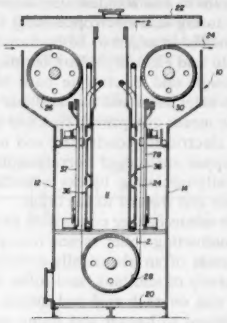
1. A cathode structure for use in an apparatus for electrolytic treatment of an elongated strip of metal in a tank containing a bath of a first electrolyte solution by drawing the strip longitudinally through the bath between a substantially flat, positively-charged anode submerged in the bath and a negatively-charged cathode, the cathode structure comprising,

metal plate means having a front surface defining a generally rectangular substantially flat cathode surface and a back surface,

a thin generally rectangular electrolyte chamber enclosing the metal plate means, the electrolyte chamber including spaced side walls and spaced end walls joined together to

define a generally rectangular frame extending around the peripheral edges of the metal plate means and front and back wall panels mounted on the frame and extending in generally parallel spaced relation to the front and back surfaces respectively of the metal plate means, the front wall panel including a portion defined by an ion-permeable membrane extending in closely-spaced relation to the cathode surface to define a thin fluid channel extending between the membrane and the cathode surface and extending over the entire cathode surface,

inlet means in the electrolyte chamber adjacent one wall of the chamber and including connector means for connection with a source of a second electrolyte solution under pressure,



outlet means in the electrolyte chamber adjacent the wall opposite the inlet for permitting the second electrolyte solution to flow through the electrolyte chamber from the inlet through the outlet,

flow divider means within the electrolyte chamber for dividing electrolyte solution flowing between the inlet and outlet means and directing a portion of the second electrolyte solution through the thin fluid channel and the remaining portion through the space between the back wall panel and the back surface of the metal plate means, means adjacent the outlet recombining the portions of the second electrolyte solution before the solution flows from the outlet, and

means for mounting the electrolyte chamber in the first electrolyte solution within the tank.

4,118,303

APPARATUS FOR CHEMICALLY TREATING A SINGLE SIDE OF A WORKPIECE

Stephen R. Gibbs, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 718,897, Aug. 30, 1976. This application May 19, 1977, Ser. No. 798,384

Int. Cl.[2] C25D *17/00*

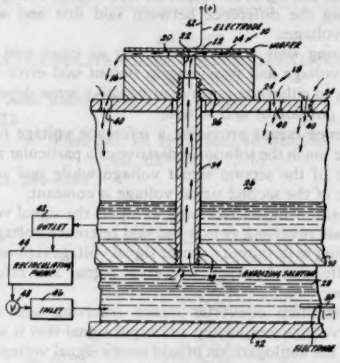
U.S. Cl. 204—224 R **6 Claims**

1. An apparatus for chemically treating one side only of a workpiece comprising:

means defining a work surface which is relatively flat and relatively horizontal;

aperture means generally centrally of said work surface and connected to a source of liquid chemical for chemically treating an entire area of said workpiece placed on said work surface; and

means for introducing said liquid chemical through said aperture in an upward direction so as to flow over this work surface and over said entire area and return to the source of liquid chemical while at the same time lifting and spacing said workpiece and chemically treating a workpiece placed on said work surface, said liquid chemi-



cal being the sole means for orienting the workpiece on work surface during said chemical treatment.

4,118,304

ELECTROLYTIC ALUMINA REDUCTION CELL WITH HEAT RADIATION REDUCING MEANS

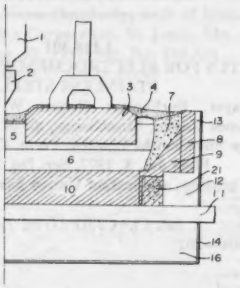
Youji Arita, Yokohhama, Japan, assignor to Mitsubishi Light Metal Industries Limited, Tokyo, Japan

Filed Aug. 16, 1977, Ser. No. 825,070

Claims priority, application Japan, Sep. 7, 1976, 51-107012

Int. Cl.[2] C25C *3/08*

U.S. Cl. 204—243 R **5 Claims**



1. In an alumina reduction cell having side walls and a bottom, arranged for containing a mass of electrolyte, and having one or more anodes each presenting a surface through which current flows, a bottom cathode formed of carbon blocks and presenting a surface through which current flows, said side walls being formed of a carbon substrate, the improvement comprising:

A body of heat insulating material being interposed at the boundary between said bottom cathode and said side walls sufficient to substantially diminish heat transfer from said bottom cathode to said side walls, wherein said heat insulating material reaches from the bottom of said boundary to at least 80% of the height of said bottom cathode.

4,118,305

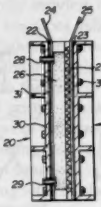
APPARATUS FOR ELECTROCHEMICAL REACTIONS

Colin William Oloman, and Alan Paul Watkinson, both of Vancouver, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 540,533, Jan. 13, 1975, Pat. No. 3,969,201. This application Jul. 12, 1976, Ser. No. 704,688

Int. Cl.[2] C25B *1/30, 9/00*

U.S. Cl. 204—265 9 Claims



1. An apparatus for carrying out electrochemical reactions involving gaseous reactants comprising an undivided electrochemical cell having a pair of spaced apart electrodes, at least one of said electrodes being in the form of a fluid permeable conductive mass and being separated from the counter electrode by a porous insulating layer which is compressed between the conductive mass and the counter electrode thereby defining a flow path which permits free flow of gas and liquid between the electrodes and which providing electrical insulation between the conductive mass and the counter electrode, inlet means for feeding a liquid electrolyte and a gas into said fluid permeable conductive mass and outlet means for removing solutions containing reaction products from said conductive mass, said inlet and outlet being arranged whereby the electrolyte and gas move co-currently through the conductive mass in a direction normal to the flow of electric current between the electrodes.

4,118,306

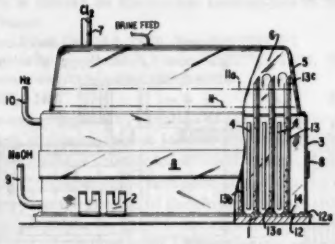
ANODE CONSTRUCTIONS FOR ELECTROLYSIS CELLS

Vittorio De Nora, Nassau, The Bahamas, and Oronzio De Nora, Milan, Italy, assignors to Diamond Shamrock Technologies S. A., Geneva, Switzerland

Division of Ser. No. 654,396, Feb. 2, 1976, Pat. No. 4,064,021, which is a division of Ser. No. 485,844, Jul. 5, 1974, Pat. No. 3,956,097. This application Feb. 28, 1977, Ser. No. 773,069

Int. Cl.[2] C25B *1/10, 1/46, 11/10, 11/03*

U.S. Cl. 204—284 4 Claims



1. An anode structure for electrolysis cells comprising a planar, electrically conductive blanket to be supported on the cell base and a plurality of vertical hollow, dimensionally stable anodes electrically connected to the blanket provided with an electrocatalytic coating, the said hollow anodes being provided with a plurality of perforations from near the bottom to some distance from the top and an upper imperforate section near the open-ended top thereof.

4,118,307

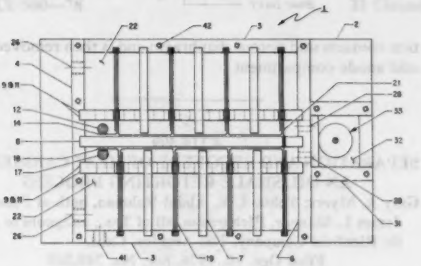
BATCH SODIUM HYPOCHLORITE GENERATOR

Ronald L. LaBarre, Euclid, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 14, 1977, Ser. No. 768,538

Int. Cl.[2] C25B *1/34, 11/10*

U.S. Cl. 204—268 12 Claims



1. A sodium hypochlorite generator-storage unit comprising:

an enclosed substantially rectangular cell made up of a cell baseplate, cell endwalls, cell sidewalls and a removable cell top plate;

means for charging said cell with brine;

means for electrolyzing said charged brine in said cell so as to form a sodium hypochlorite solution; said electrolyzing means comprising substantially rectangular vertically-arranged plate like electrodes consisting of at least one anode and one cathode, said anode being approximately twice the size of said cathode and being U-shaped so as to be parallel to and essentially enclose the related cathode, said cathode having a valve metal surface and the inner surface of said U-shaped anode having thereon an electroconductive, catalytically active dimensionally stable coating thereon;

means to vent the hydrogen formed during the electrolysis from said cell;

means to discharge the sodium hypochlorite solution formed by electrolysis in said cell when desired; and control means which, when activated, effects the discharge of a precise amount of sodium hypochlorite solution, discontinues such a discharge, refills said cell with brine, electrolyzes the brine to obtain the desired hypochlorite concentration, and then awaits reactivation.

4,118,308

METHOD OF RENEWING A POROUS DIAPHRAGM HAVING REDUCED PERMEABILITY TO ALKALI METAL CHLORIDE BRINES

Steven J. Specht, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

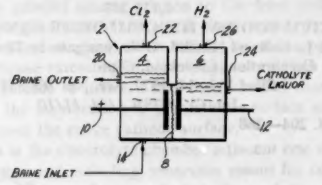
Filed Dec. 20, 1977, Ser. No. 862,308

Int. Cl.[2] C25B *13/08, 13/04, 15/00*

U.S. Cl. 204—296 13 Claims

1. A method of renewing a porous diaphragm comprised of a synthetic fluorocarbon resin having cation exchange properties, said porous diaphragm having reduced permeability to alkali metal chloride brines in an electrolytic cell having an anode compartment and a cathode compartment, said porous diaphragm separating said anode compartment from said cathode compartment, said method which comprises feeding an alkaline solution of an alkali metal chloride having a pH of from about 9 to about 12 to said anode compartment, circulating said alkaline solution in said anode compartment such that

a first portion of said alkaline solution passes through said porous diaphragm and a second portion of said alkaline solution contacts said porous diaphragm and is then removed from said anode compartment.

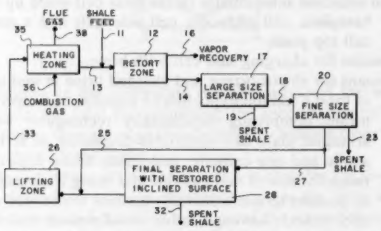


4,118,309

SEPARATION AND RECOVERY OF HEAT CARRIERS IN AN OIL SHALE RETORTING PROCESS

Gary A. Myers; Yahia A. K. Abdul-Rahman, both of Plano, and James L. Skinner, Richardson, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 10, 1976, Ser. No. 749,505
Int. Cl.[2] C10G *1/02;* C10B *53/06*
U.S. Cl. 208—11 R **33 Claims**



1. In a method for retorting crushed oil shale containing carbonaceous organic matter and mineral matter wherein oil shale is retorted by contacting said oil shale with hot heat-carrying spherically-shaped solids in a retort zone to produce gas and oil products and a mixture of said spherically-shaped solids and irregularly-shaped particulate spent shale, and wherein at least eighty percent by weight of said spherically-shaped solids are reheated and recycled to said retort zone and at least 75 percent by weight of the spent shale is separated from said mixture and disposed, the improvement comprising:

a. feeding a mixture of spherically-shaped solids and spent shale at a first point having a first side and a second side onto an initial impingement area of an inclined surface whereon most of said spherically-shaped solids fed onto said inclined surface roll from said inclined surface while most of said spent shale fed onto said inclined surface remains on said inclined surface;

b. moving the portion of said inclined surface with spent shale thereon during the time that step (a) is taking place in a direction such that said impingement area of said inclined surface is constantly changing and said portion moves away from said first side of said first point and returns to said second side of said first point before said portion returns to said first side of said first point;

c. collecting the spherically-shaped solids which have rolled from said inclined surface, and

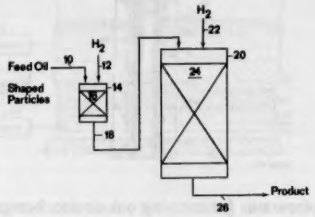
d. removing spent shale from said inclined surface at a second point located away from said first point where said spherically-shaped solids and spent shale are fed onto said inclined surface in step (a).

4,118,310

HYDRODESULFURIZATION PROCESS EMPLOYING A GUARD REACTOR

James Albert Frayer, Pittsburgh; Henri K. Lese, Monroeville; Joel Drexler McKinney, Pittsburgh; Kirk J. Metzer, Pittsburgh, and John Angelo Paraskos, Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jun. 28, 1977, Ser. No. 810,858
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—210 **14 Claims**



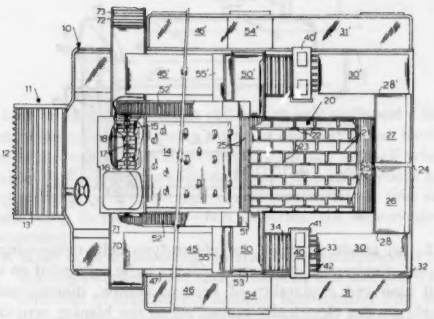
1. In a process for the hydrodesulfurization of an asphaltene-containing oil containing sulfur and metals at a hydrogen pressure between 1,000 and 5,000 psi and a temperature between 600° and 900° F. wherein said oil and hydrogen are passed downwardly in trickle flow through upstream and downstream reactors in series and wherein the catalyst in both reactors comprises Group VI and Group VIII metals on a non-cracking support, the invention comprising the particles of said catalyst in said upstream reactor comprising elongated extrudates which show in cross-section at least one groove defining protrusions and an average concavity index between about 1.01 and 1.35, the shortest distance between the depth of said at least one groove and the center in said cross-section being between 1/30 and 1/120 inch, and employing a higher liquid mass velocity in said upstream reactor than in said downstream reactor, said higher liquid mass velocity permitting a given amount of desulfurization in said upstream reactor at a lower temperature than the temperature required at the liquid mass velocity of the downstream reactor.

4,118,311

TOMATO HARVESTING SORTING SYSTEM

William C. Friedel, Jr., Los Banos, and Charles F. Dietz, Rio Vista, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 18, 1976, Ser. No. 733,157
Int. Cl.[2] B07C *5/12;* A01D *46/00*
U.S. Cl. 209—75 **9 Claims**



1. A tomato harvester sorting system wherein tomatoes after

detachment from the vines are collected and moved rearwardly to a rear cross-conveyor, said harvester also having means for separating dirt clods and loose tomatoes from the vines before said detachment and depositing the clods and loose tomatoes on a clod conveyor system, comprising:

a horizontal forwardly-moving pre-sorting conveyor on which fall the tomatoes from said rear cross-conveyor, having an adjacent platform segment for workers to stand on and remove vegetative trash, the tomatoes falling off the forward end of said pre-sorting conveyor.

an elevating forwardly-moving conveyor having a lower end for catching tomatoes falling from said pre-sorting conveyor and a flighted member for moving them to an upper end, from which the elevated tomatoes fall,

cull disposal means to the rear of said elevating conveyor,

a electromechanical sorter having means for judging the redness or greenness of tomatoes falling from said forward end of said pre-sorting conveyor and mechanical means for impelling green tomatoes into said cull disposal means while not interfering with the fall of red tomatoes into said elevating conveyor,

an after-sorting conveyor receiving the red tomatoes falling from the upper end of said elevating conveyor and carrying them forward and generally horizontally to an output end and having an adjacent platform segment for workers to stand on to remove blemished and overripe fruit therefrom, and

an outwardly-moving lateral clod-conveyor, being the terminal portion of said clod conveyor system, for carrying clods and loose tomatoes outwardly, having a cull chute at the outer end thereof into which the material on said clod conveyor falls, said clod conveyor being perpendicular to and positioned directly over said elevating conveyor and forward of said electromechanical sorter and having a platform segment adjacent its outer end for receiving a worker for removing good tomatoes from said clod conveyor for placing them in the main sorting stream with the red tomatoes.

4,118,312

PROCESS FOR THE CONCENTRATION BY FLOTATION OF FINE MESH SIZE OR OXIDIZED ORES OF COPPER, LEAD, ZINC

Gilles Barbery, and Jean-Luc Cecile, both of Orleans, France, assignors to Bureau de Recherches Geologiques et Minieres, Paris, France

Filed Dec. 13, 1976, Ser. No. 750,302

Claims priority, application France, Dec. 15, 1975, 75 38393

Int. Cl.[2] B03D *1/14*

U.S. Cl. 209—166 **6 Claims**

1. In the concentration by flotation of an oxidized ore having a mean mesh size below about 160μm, comprising suspending the ore in an aqueous solution of a flotation reagent, agitating and aerating the suspension whereupon at least a portion of the ore particles floats to the top of the suspension and recovering the floating particles, the improvement which comprises employing as said flotation reagent a beta-diketone selected from the group consisting of acetylacetone, 2,2,6,6-tetramethyl-3,5-heptadione, 6-methyl-2,4-heptadione and 2-methyl-4,6-dodecadione, the pH of the aqueous beta-diketone solution being from about 5 to 9, and said oxidized ore comprising at least one of lead oxide, copper oxide and zinc oxide and at least one of a carbonate and silicate gangue.

4,118,313

PROCESS AND APPARATUS FOR MASS TRANSFER BETWEEN HETEROGENEOUS SYSTEMS

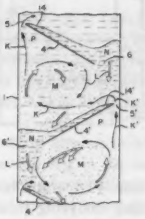
Eugen Hadamovsky; Wolfgang Hoppe; Hans-Walter Overhausen, all of Witten; Bernhard Piotrowski, Bochum; Wehrhart Schmid, Karlsruhe; Georg Schreiber, Cologne-Rodenkirchen, and Heinz Schroeder, Witten, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Continuation of Ser. No. 520,864, Nov. 4, 1974, abandoned. This application Jul. 14, 1976, Ser. No. 705,243

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1973, 2355106

Int. Cl.[2] B01D *11/04*

U.S. Cl. 560—78 **21 Claims**



1. A process for mass transfer between heterogeneous systems or phases in a vertical exchange column having a plurality of plates, a heavier stream of matter being introduced above the plates and, a lighter stream of matter being introduced countercurrently thereto from the bottom of the plates, characterized in that:

(a) a first heavier stream of matter fed from the top is angularly deflected, above one plate, into a first mixing zone wherein the heavier stream undergoes vertical rotary movement in one sense of direction and a lighter stream of matter passing from below through a first passageway of said one plate is introduced into the mixing zone and is caused to also undergo vertical rotary movement together with the heavier stream in the same sense of direction whereby mixing of the streams is effected;

(b) a heavier phase, suspension, or the like fluid-like mass is formed in the mixing zone during the mass transfer therein and is accumulated in an enrichment zone below the mixing zone and superajcent to a second passageway of said one plate;

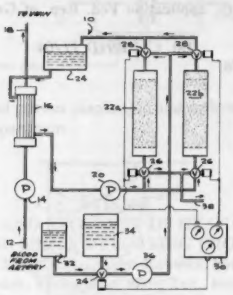
(c) a lighter phase or like fluid-like mass is also formed in the mixing zone during the mass transfer therein and is directed upwardly above the mixing zone to provide another enrichment zone, said mixing zone extending between the enrichment zones; and

(d) after a sufficient pressure gradient has been built up between the accumulated mass above the second passageway and a lighter stream below the first passageway, the accumulated mass flows as another heavier stream through the second passageway into a space underneath said one plate and is at this location angularly deflected into a second mixing zone wherein the another heavier stream undergoes vertical rotary movement, having a sense of direction of rotation opposite to that in the first mixing zone above said one plate, and is mixed with another lighter stream of matter fed from below in the same manner as mixing occurs in the first mixing zone, said second mixing zone also extending between two enrichment zones.

4,118,314
APPARATUS FOR TREATMENT OF ARTIFICIAL KIDNEY DIALYZING FLUID

Fumitake Yoshida, Kyoto, Japan, assignor to Seisan Kaihatsu Kagaku Kenkyusho, Kyoto, Japan

Continuation of Ser. No. 432,092, Jan. 9, 1974, abandoned. This application May 19, 1975, Ser. No. 578,939
Int. Cl.[2] B01D *13/00, 15/06*
U.S. Cl. 210—22 C 6 Claims



1. In an artificial kidney apparatus having a hemodialyzer for treating a recirculating dialyzing fluid, an adsorbent bed for receiving said dialyzing fluid for removal of contained toxins, and a desorbing fluid for desorbing said adsorbent bed of said toxins, the improvement comprising:

a plurality of adsorbent beds for treating said dialyzing fluid,

first flow control means for repeatedly and alternately selecting one and then another of said adsorbent beds for receiving said dialyzing fluid,

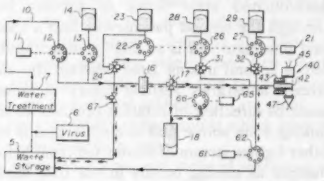
second flow control means for repeatedly and alternately selecting one of said adsorbent beds for receiving water as a desorbing liquid after said adsorbent bed received said dialyzing fluid, whereby one of said adsorbent beds will repeatedly and alternately receive the dialyzing fluid to remove toxins therefrom and thereafter water as the desorbing fluid to desorb said toxins and reactivate the adsorbent bed while another of said adsorbent beds passes through a reverse cycle,

third flow control means for repeatedly and alternately selecting one of said adsorbent beds for receiving fresh dialyzing fluid to displace said water remaining in said adsorbent bed and to effect further desorption of said toxins in said adsorbent bed after said adsorbent bed received said water as a desorbing liquid.

4,118,315
WATER SYSTEM VIRUS DETECTION

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Alan S. Fraser, Whittier; Arthur F. Wells, Upland, and Harold J. Tenoso, Burbank, all of Calif.

Filed Apr. 28, 1977, Ser. No. 792,068
Int. Cl.[2] B01D *13/00, 31/00*
U.S. Cl. 210—23 F 16 Claims



1. A process for monitoring the performance of a water recovery purification system in removing pathogenic viruses, said process comprising the steps of:

introducing a non-pathogenic bacteriophage marker virus at a predetermined concentration upstream of said water recovery system;

collecting a sample of effluent from said water recovery system;

concentrating any marker virus present in said effluent sample by mixing said sample with a solution containing a trivalent cation formed from a solution containing $AlCl_3$ to obtain a resulting mixture with a pH of 2.5–3.5,

passing said resulting mixture through a cellulose acetate filter to adsorb any of said marker virus onto said filter, and thereafter

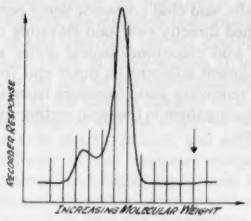
desorbing any of said marker virus from said filter by passing a selected quantity of a buffer solution through said filter to form a solution containing an increased concentration of said virus; and

testing said concentrated sample for said marker virus to monitor said water recovery purification system.

4,118,316
QUATERNIZED SILICEOUS SUPPORTS FOR GEL PERMEATION CHROMATOGRAPHY

Charles P. Talley, Prosperity, Pa.; Guy M. Bradley, Chesterfield, Mo., and Ronald T. Guliana, Monroe, Mich., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Oct. 13, 1976, Ser. No. 731,969
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—31 C 17 Claims



3. A gel permeation chromatographic method for the separation of molecular weight fractions of a cationic polymer which comprises passing a solution of said polymer through a porous chromatography bed of a rigid, non-swellable, controlled porosity glass support having a porosity of from about 50 to about 25,000 Angstroms, said support having a quaternized siliceous surface which is prepared by treating the siliceous surface with a silane compound and a quaternizing agent.

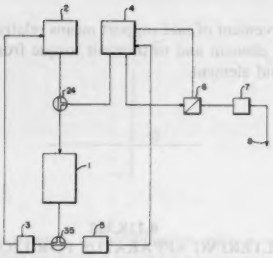
4,118,317
METHOD OF PURIFYING ION EXCHANGER RESINS SPENT IN THE OPERATION OF A NUCLEAR REACTOR

Karl-Heinz Neeb, Erlangen, and Heinrich Richter, Fürth, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mühlheim (Ruhr), Germany

Filed Feb. 22, 1977, Ser. No. 770,289
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1976, 2607292
Int. Cl.[2] B01D *15/06*
U.S. Cl. 210—32 7 Claims

1. In a method of treating liquid coolant from a coolant loop of a nuclear reactor and containing radioactive fission and corrosion products and chemical substances for conditioning the coolant by pasing said liquid coolant in contact with mixed-bed ion exchanger resins to remove radioactive fission and corrosion products which are radionuclides mechanically and chemically bound as radioactive cations and anions to the ion exchanger resins, the ion exchanger resins also removing con-

ditioning substances, the combination therewith comprising the sequential steps of freeing from radioactive fission and corrosion products and from conditioning substances the ion exchanger resins spent in the operation of removal of said products and said substances by thoroughly rinsing the resin with demineralized water so as to release said mechanically bound suspended radioactive substances from the resins, separating the released suspended radioactive substances contained in the demineralized water in a mechanical filter, rinsing with diluted mineral water in a mechanical filter, rinsing with di-



luted mineral acid the resin previously rinsed with demineralized water so as to release radioactive cations and anions therefrom and produce a mineral acid containing radionuclides of said radioactive cations and anions together with the conditioning substances, selectively adsorbing radionuclides of the cations and anions in an adsorber substance which is a reactant for the radionuclides fixed on an inorganic carrier, separating the conditioning substances from the mineral acid with which the resins have been rinsed and coverting the separated conditioning substances into a form of chemical compounds used in said liquid coolant for reuse in liquid coolant.

4,118,318

GAS SCRUBBER SCALE AND DEPOSIT CONTROL

Gerald Elvin Welder, Hudson; Edward Russell Lang, Lakewood, both of Ohio, and Charles Wilmer Slagle, Wexford, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

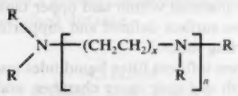
Continuation-in-part of Ser. No. 733,723, Oct. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 647,253, Jan. 7, 1976, abandoned. This application Sep. 22, 1977, Ser. No. 835,625

Int. Cl.[2] **C02B** *5/06*

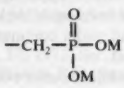
U.S. Cl. 210—58 **19 Claims**

1. A composition useful for controlling deposit build-up in gas scrubbers consisting essentially of a scale inhibitor selected from the group consisting of:

a. phosphonates of the general formula:

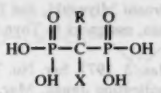


wherein R is



M is H, NH_4, alkali metal or combinations thereof;
N is 0 to 6; and
x is 1 to 6;

b. phosphonates of the general formula:



wherein X is — OH or — NH_2 and R is an alkyl group of from 1 to 5 carbon atoms; and

c. sodium polyphosphates and phosphate esters of the formula:

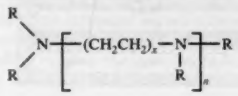
$$N\,[ROPO_3M_2]_3$$

wherein M may be — H, — NH_2 or a monovalent metal ion and R is an alkylene group having from 1 to 18 carbon atoms;

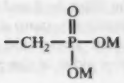
and at least one water-soluble polymer selected from the group consisting of polyacrylamides, poly(2-acrylamido methyl propane sulfonic acid) and sulfonated polystyrenes, said polymer having a molecular weight of at least 25,000 wherein the ratio of scale inhibitor to polymer is from about 1:10 to about 10:1 by weight.

11. A method of controlling deposit build-up in gas scrubbers which comprises maintaining in the aqueous scrubbing medium at least 0.01 ppm of a composition consisting essentially of a scale inhibitor selected from the group consisting of:

a. phosphonates of the general formula:

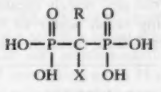


wherein R is



M is H, NH_4, alkali metal or combinations thereof;
n is 0 to 6; and
x is 1 to 6;

b. phosphonates of the general formula:



wherein X is — OH or — NH_2 and R is an alkyl group of from 1 to 5 carbon atoms; and

c. sodium polyphosphates and phosphate esters of the formula:

$$N[ROPO_3M_2]_3$$

wherein M may be — H, — NH_2 or a monovalent metal ion and R is an alkylene group having from 1 to 18 carbon atoms; and at least one water-soluble polymer selected from the group consisting of polyacrylamides, poly(2-acrylamido methyl propane sulfonic acid) and sulfonated polystyrenes, said polymer having a molecular weight of at least 250,000, wherein the ratio of scale inhibitor to polymer is from about 1:10 to about 10:1 by weight.

4,118,319

TREATMENT OF SLUDGE

Isao Miyanohara; Hiroshi Miyazaki, and Hideo Kawamura, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Mar. 3, 1977, Ser. No. 774,051

Claims priority, application Japan, Mar. 11, 1976, 51-25526; Apr. 14, 1976, 51-41201; May 18, 1976, 51-56114

Int. Cl.[2] C02B *1/20;* C02C *3/00*

U.S. Cl. 210—51 **9 Claims**

1. A treatment of a sludge containing biological aggregate or polyvalent metal hydroxide aggregate, which consists of adding light burned magnesia to said sludge, adjusting the pH of said sludge to the range of from 9 to 12 and filtering said sludge.

4,118,320

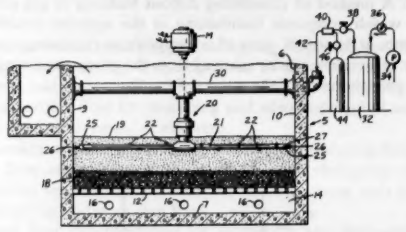
METHOD AND APPARATUS FOR AGITATING AND SCRUBBING FILTER BED

Fred E. Stuart, 1157 Bel Aire Dr., Daytona Beach, Fla. 32020

Filed Jul. 20, 1977, Ser. No. 817,234

Int. Cl.[2] B01D *23/24*

U.S. Cl. 210—80 **1 Claim**



1. An agitator mechanism for washing and cleaning the filter medium of a filter bed comprising:

a tubular agitator arm horizontally disposed near but beneath the top of the filter bed and rotatable on a vertical axis near the longitudinally central region of the arm,

nozzle means distributed along said arm including nozzles directed to respective sides of the arm on respective sides of said axis,

means for supplying air under pressure to said arm and therethrough to said nozzle means to scrub the filter bed medium in the region of said arm by the air jets emerging from said nozzle means,

means for supplying oxygen to the air flowing to said nozzle means so as to enrich the air with added oxygen,

motor means for rotating said arm independently of the air jets emerging from said nozzle means, and

means for supplying wash water to the filter bed at the bottom for upward flow through the filter bed.

4,118,321

DEVICE FOR TANKS OF CIRCULAR TYPE SUCH AS, FOR EXAMPLE, THICKENERS, SLUDGE TANKS, MIXING TANKS AND THE LIKE

Jan O. Bogen, Sala, Sweden, assignor to Sala International AB, Sala, Sweden

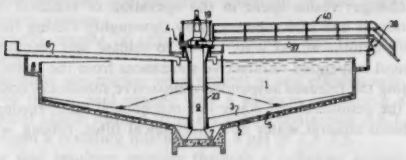
Filed Nov. 29, 1976, Ser. No. 745,535

Claims priority, application Sweden, Nov. 28, 1975, 7513429

Int. Cl.[2] B01D *21/18*

U.S. Cl. 210—91 **5 Claims**

1. In a circular tank having at least one arm extending radially outwardly over the bottom thereof, a central pillar coaxial with the tank, means supporting said arm on said pillar for vertical movement relative to said pillar, and means for swinging said arm about said axis; the improvement comprising a rigid element that extends generally radially outwardly of said support means and that is secured adjacent its outer end to a fixed point on the periphery of said tank, and means acting between said supporting means and said element to permit



vertical movement of said support means relative to said outer end of said element and to transmit torque from said support means to said element.

4,118,322

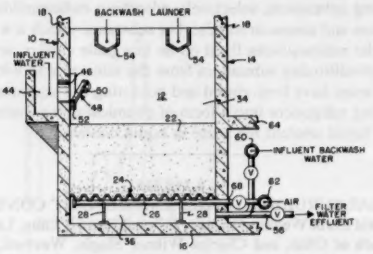
FILTERING APPARATUS FOR LIQUIDS

Guillermo A. San Roman, Hempstead, N.Y., assignor to Hydrotechnic Corporation, New York, N.Y.

Filed May 17, 1976, Ser. No. 687,365

Int. Cl.[2] B01D *23/18, 23/24*

U.S. Cl. 210—136 **9 Claims**



9. A filter for cleaning a flow of liquid, said filter comprising:

a filter tank having upper and lower chambers;

a fluid inlet assembly communicating with said lower tank chamber,

means within said tank for supporting a filter material bed, said means dividing said tank into upper and lower chambers;

means extending through said filter bed supporting means for providing fluid communication between said upper and lower tank chambers;

a bed of filter material within said upper tank chamber having a bottom surface defined and supported by said filter bed supporting means;

a normally open influent filter liquid inlet assembly communicating with said tank upper chamber, said inlet assembly including an inlet passage and means including a pivotally mounted, buoyant valve member for automatically closing said passage upon said upper tank chamber being filled to a predetermined level with backwash fluid;

an effluent filter liquid outlet communicating with said tank lower chamber; and

an effluent backwash liquid outlet communicating with said tank upper chamber and located at a level within said tank which is higher than said predetermined level and the level of said influent liquid inlet passage for providing a substantially vertical flow of said backwash liquid from the bed upper surface throughout said tank.

4,118,323

STRAINER

Masaaki Sugiyama, Fuji; Takuo Yuda, Sagamihara, and Akira Mizusawa, Fujisawa, all of Japan, assignors to Yamakawa Industry Co. Ltd. and Nifco, Inc., Tokyo, both of, Japan

Continuation of Ser. No. 771,592, Feb. 24, 1977, abandoned, which is a continuation of Ser. No. 584,234, Jun. 5, 1975, abandoned. This application Oct. 26, 1977, Ser. No. 845,522
Claims priority, application Japan, Jun. 11, 1974, 49-67054
Int. Cl.[2] C02C *1/14*
U.S. Cl. 210—439 2 Claims

1. A plastic strainer in combination with a suction pipe having an annular projection spaced a predetermined distance from the free end of said pipe, said strainer including a strainer body member having a tubular top frame, imperforated bottom board, a plurality of axially extending circumferentially spaced support elements with each support element integrally attached at opposite ends to said top frame and said bottom board, a plurality of resilient arms extending axially between the free end of said top frame, said arms including shoulder means intermediate their length, a tubular filtration net integrally attached to and embedded in and extending between the opposed surfaces of said top frame and of said bottom board, said net extending throughout the axial extent of said support elements and embedded and integrally connected and supported therein along a line intermediate the radial extent of said elements, a centrally appertured cover member removably attached to said strainer body, said cover member including a plurality of circumferentially spaced complementary openings equal in number to said arms for telescopingly accepting said arms within shouldered portion of said arms engaging the outer surface of said cover when said cover is seated against said top frame, an open ended tubular connector element molded integrally with the cover top and communicating with said central apperature to provide a continuous bore through said connector element and said cover, said bore in said tubular connector element being tapered from its free end to an annular groove circumferentially disposed therein and adapted to accept said annular projection on said suction pipe in complementary relation when the suction pipe is telescoped through the tubular connector element end cover whereby said suction pipe free end is maintained in spaced relation to said bottom board being spaced a greater distance from said cover element the said predetermined distance.

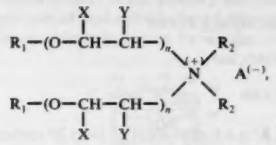
4,118,324

FABRIC SOFTENERS

Willi Steckelberg, Hofheim am Taunus; Hans Ludwig Panke, Frankfurt am Main; Adolf May, Hofheim am Taunus, and Hans-Walter Bücking, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 17, 1977, Ser. No. 807,402
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 2651898
Int. Cl.[2] D06M *13/46*
U.S. Cl. 252—8.9 3 Claims

1. Fabric softeners in the form of aqueous solutions or dispersions, which contain an active ingredient one or several compounds of the formula



in which R_1 represents identical or different aliphatic radicals having 8 to 30 carbon atoms, cyclohexyl groups or aryl groups optionally substituted by alkyl groups, X and Y stand for a hydrogen atom or a methyl group, however, X and Y not being methyl at the same time, n is an integer of 1 to 20, R_2 represents alkyl groups having 1 to 4 carbon atoms or benzyl groups, and A is a methosulfate, chloride, bromide or methophosphate ion.

4,118,325

FIREPROOFING COMPOSITION

Donald E. Becker; Gary D. Achenbach, both of Ponca City, and George W. Stuever, Kildare, all of Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Dec. 27, 1976, Ser. No. 754,793
Int. Cl.[2] C09K *3/28*
U.S. Cl. 252—8.1 4 Claims

1. A fireproofing composition comprising a low density foamed alkali metal silicate matrix having incorporated therein, on a dry weight basis, from 5 to 35 weight percent of an unexpanded particulate mineral material selected from the group consisting of unexpanded vermiculite and unexpanded perlite, said material having a particle size range of from 6 to 200 mesh and being capable of expanding to from 5 to 20 times its unexpanded volume upon exposure to heat.

4,118,326

SPIN-FINISH LUBRICATING METHOD

Robert B. Login, Woodhaven, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 521,691, Nov. 7, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,460
Int. Cl.[2] D06M *13/30, 5/10, 13/00*
U.S. Cl. 252—8.6 6 Claims

1. In a process of spin-finishing a synthetic textile fiber in which the fiber passes over and in contact with a heating plate maintained at a temperature of 150° to 300° Centigrade, the improvement which comprises applying to said fiber before its passage over said heating plate an amount effective to promote the handling properties of said fiber of a textile-lubricant composition, said composition consisting essentially of and effectively oxidation-reducing and stability-promoting amount up to 2 weight percent of a salt of a metal selected from the group consisting of the alkali and alkaline-earth metals with a saturated carboxylic acid containing up to 18 carbon atoms and the balance being a liquid polyalkoxylate nonionic surfactant material.

4,118,327

FABRIC SOFTENER AND ANTI-STATIC COMPOSITIONS

Monique Seugnet, Colombes, France, assignor to Colgate Palmolive Company, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 777,994
Int. Cl.[2] D06M *13/44*
U.S. Cl. 252—8.8 14 Claims

1. A fabric softening and anti-static composition consisting essentially of:

(1) from about 0.1% to about 5% by weight of the total composition of at least one phosphoric acid ester or a salt thereof selected from the group consisting of

$R^1O(CH_2CH_2O)_mPO(OM)_2$ I

$[R^1O(CH_2CH_2O)_m]_2$ POOM II

$R^2OPO(OM)_2$ and III

$(R^2O)_2POOM$ IV

wherein R^1 is a higher alkyl of 14 to 20 carbon atoms, *m* is from 1 to 10, M is a hydrogen, alkali metal or ammonium and R^2 is an alkyl of 6 to 10 carbon atoms, and (2) from about 0.1 to about 10% by weight of the total composition of at least one cationic fabric softening agent.

4,118,328

AMINE PHOSPHATE SALTS

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 8, 1977, Ser. No. 858,585
Int. Cl.² C10M *1/44, 3/38;* C07F *9/08, 9/16*
U.S. Cl. 252—32.5 **9 Claims**

1. A process for preparing a phosphate salt which comprises heating a triaryl phosphate and a primary or secondary aliphatic amine in the molar ratio of 1:1–20 respectively at a temperature of 100°–200° C. for 0.5–30 hours in the presence of a catalytic amount of boric acid to yield said phosphate salt.

5. The product prepared by the process of claim **1**.

4,118,329

AMINE PHOSPHATE SALTS AND PHOSPHORAMIDES

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 8, 1977, Ser. No. 858,586
Int. Cl.² C10M *1/44, 3/38, 5/24, 7/24*
U.S. Cl. 252—32.5 **9 Claims**

1. A process comprising heating a triaryl phosphate and a primary or secondary aliphatic amine in the molar ratio of 1:1–20 respectively, at a temperature of 100°–200° C. for 0.5 to 30 hours in the presence of a catalytic amount of a trialkyl borate wherein the alkyl portion contains from 2 to 6 carbon atoms, to yield a mixture comprising a minor proportion of phosphoramide and a major proportion of phosphate salt.

5. The product prepared by the process of claim **1**.

4,118,330

AMINE PHOSPHATE SALTS AND PHOSPHORAMIDES

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 8, 1977, Ser. No. 858,587
Int. Cl.² C10M *1/44, 3/38, 5/24, 7/24*
U.S. Cl. 252—32.5 **9 Claims**

1. A process comprising heating a triaryl phosphate and a primary or secondary aliphatic amine in the molar ratio of 1:1–20 respectively, at a temperature of 100°–200° C. for 0.5 to 30 hours in the presence of a catalytic amount of boron trifluoride to yield a mixture comprising a major proportion of phosphoramide and a minor proportion of phosphate salt.

5. The product prepared by the process of claim **1**.

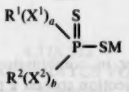
4,118,331

METHOD FOR WORKING METAL AND LUBRICANTS FOR USE THEREIN

Richard William Jahnke, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

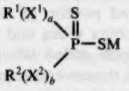
Continuation-in-part of Ser. No. 574,675, May 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 439,656, Feb. 4, 1974, abandoned, and Ser. No. 504,414, Sep. 9, 1974, abandoned. This application Jan. 11, 1977, Ser. No. 758,525
Int. Cl.² C10M *1/48, 3/42, 5/24;* B21B *45/02*
U.S. Cl. 252—32.7 E **44 Claims**

1. A method for lubricating metal during working thereof which comprises applying to said metal a composition free from elemental sulfur and triaryl phosphates and comprising (A) an oil of lubricating viscosity, (B) at least one substituted succinic acid in which the substituent is a hydrocarbon-based substituent containing 6–75 carbon atoms of an anhydride or lithium salt thereof, and (C) at least one phosphorus acid salt having the formula



wherein M is a Group I metal, a Group II metal, aluminum, tin, cobalt, lead, molybdenum, manganese, nickel or ammonium; each of R^1 and R^2 is a hydrocarbon-based radical; each of X^1 and X^2 is oxygen or sulfur; and each of *a* and *b* is 0 or 1; components B and C comprising about 3–30% by weight of said composition and about 0.5–5.0 parts by weight of component B being present per part of component C.

26. A metal workpiece having on its surface a film of a composition free from elemental sulfur and triaryl phosphates and comprising (A) an oil of lubricating viscosity, (B) at least one substituted succinic acid in which the substituent is a hydrocarbon-based substituent containing 6–75 carbon atoms or an anhydride or lithium salt thereof, and (C) at least one phosphorus acid salt having the formula



wherein M is a Group I metal, a Group II metal, aluminum, tin, cobalt, lead, molybdenum, manganese, nickel or ammonium; each of R^1 and R^2 is a hydrocarbon-based radical; each of X^1 and X^2 is oxygen or sulfur; and each of *a* and *b* is 0 or 1; components B and C comprising about 3–30% by weight of said composition and about 0.5–5.0 parts by weight of component B being present per part of component C.

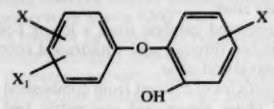
4,118,332

SYNERGISTIC ANTIBACTERIAL COMPOSITION CONTAINING MIXTURES OF CERTAIN HALOGENATED DIPHENYL ETHERS AND TRICHLOROCARBANILIDES

George Nikolas Apostolatos, New York, N.Y.; James Calvin Bohrer, East Brunswick, and Jack Thomas Inamorato, Westfield, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

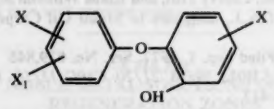
Continuation-in-part of Ser. No. 502,577, Oct. 22, 1965. This application Mar. 1, 1968, Ser. No. 709,799
Int. Cl.² C11D *3/48, 9/50*
U.S. Cl. 252—107 **18 Claims**

1. An antibacterial composition effective against both gram-positive and gram-negative bacteria comprising in combination (1) a diphenyl ether compound having the formula



wherein X is a halogen and X_1 is a member selected from the group consisting of hydrogen and halogen; and (1) at least one compound selected from the group consisting of 3,4,4'-trichlorocarbanilide - and 3,3'4-trichlorocarbanilides the ratio of (1) to (2) being about 1:3 to 3:1.

9. An antibacterial detergent composition effective against both gram-negative and gram-positive baterial comprising a detergent selected from the group consisting of soaps and non-soap synthetic anionic, nonionic, cationic and amphoteric detergents and from about 0.01% to about 5% by weight of a mixture of (1) of diphenyl ether compound having the formula



wherein X is a halogen and X_1 is a member selected from the group consisting of hydrogen and halogen; and (2) at least one compound selected from the group consisting of 3,4,4' trichlorocarbanilide - and 3,3'4-trichlorocarbanilide the ratio of (1) to (2) being about 1:3 to 3:1.

4,118,333
MANUFACTURE OF PARTICULATE DETERGENTS

Bernard Baron Dugan, Bryanston, and Jacobus Cornelius Welgemoed, Edenvale, both of South Africa, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,561

Claims priority, application South Africa, Oct. 20, 1975, 75/6587; Jan. 21, 1976, 76/0345

Int. Cl.[2] C11D *11/00, 7/16, 3/04*

U.S. Cl. 252—135 **11 Claims**

1. A method of making a detergent composition in particulate, cellular form comprising the steps of forming an aqueous slurry of detergent components selected from the group consisting of water-soluble anionic or nonionic detergent salt, detergent builder salts, detergent adjuvants, and mixtures thereof, said slurry containing between 30 to 60% by weight of water and having a temperature of 20° C. to 100° C.; heating a layer of said aqueous slurry by means of microwave radiant energy in a microwave heating zone for a period sufficient to vaporize an amount of the water sufficient to effect intumescence and setting of said slurry into the form of a cellular mass; and fragmenting said cellular mass to form a particulate detergent composition having the bulk density of a spray dried detergent composition.

4,118,334
PRIMARY ELECTROCHEMICAL CELL

Franz Goebel, Ashland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

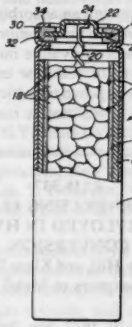
Division of Ser. No. 614,467, Sep. 18, 1975, Pat. No. 4,060,668, which is a continuation-in-part of Ser. No. 539,749, Jan. 9, 1975, abandoned. This application Jun. 3, 1977, Ser. No. 803,127

Int. Cl.[2] H01M *4/00*

U.S. Cl. 252—182.1 **9 Claims**

1. A method for forming a cathode material for a primary electrochemical cell, which material is an aggregate of porous globules of superior density, said material being formed essentially from carbon black, a binder, and a suitable liquid, said method comprising the steps of

mixing a quantity of said carbon black with a quantity of said binder which is inert in the primary electrochemical cell and an amount of said suitable liquid, the quantity of said binder being at least 1 percent by weight of the resulting



cathode material, the amount of liquid being at least an amount effective to cause the mix to form small, generally spherical masses, and

curing the mix for a time sufficient to stabilize said binder.

4,118,335
LIQUID CRYSTALLINE MATERIALS OF REDUCED VISCOSITY

Joachim Krause; Ralf Streinstrasser; Ludwig Pohl; Fernando Del Pino, and Georg Weber, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Germany

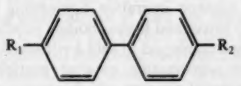
Filed Oct. 8, 1976, Ser. No. 730,953

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1975, 2548360

Int. Cl.[2] G09K *3/34;* **C02F** *1/13*

U.S. Cl. 252—299 **14 Claims**

1. A nematic or nematic-cholesteric liquid crystalline composition comprising a mixture of (a) at least one nematic or nematic-cholesteric liquid crystalline material and (b) an amount effective to lower the viscosity of (a) of a biphenyl compound of the formula



wherein R_1 and R_2 each are straight-chain alkyl of 2–12 carbon atoms and collectively contain at least 5 carbon atoms.

4,118,336
NOVEL CELLULOSE MICROCAPSULES AND PREPARATION THEREOF

Masataka Morishita, Shizuoka; Yasuo Yokokawa, Tokyo; Tokio Nishikawa, Hikone; Masahiro Mishiro; Shigeyasu Ohashi, both of Moriyama; Mitsuru Fukushima, Shizuoka; Yoshihito Inaba, Shizuoka, and Tetsuo Matsuda, Shizuoka, all of Japan, assignors to Toyo Jozo Company, Ltd. and Asahi Kasei Kogyo Kabushiki Kaisha, both of, Japan

Continuation-in-part of Ser. No. 560,937, Mar. 21, 1975, abandoned. This application Dec. 15, 1976, Ser. No. 750,588

Claims priority, application Japan, Mar. 25, 1974, 49-32686

Int. Cl.[2] B01J *13/02*

U.S. Cl. 252—316 **20 Claims**

1. An adsorbing cellulose microcapsule having selective adsorbing capacity and an outer diameter from 100 to 5000 microns, consisting of an outer semipermeable barrier layer of cellulose from about 0.5 to 5 microns in thickness having mi-

cropores from 10 to 80 angstroms in diameter and adsorbent powders which are dispersed within cellulose gel matrix innerside of said barrier layer and having a void volume equal to at least 25% of the total volume thereof.

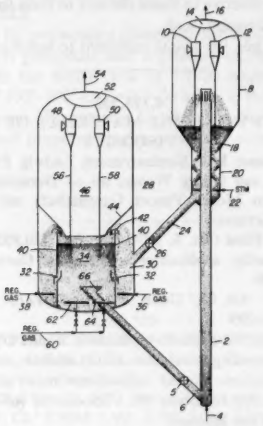
2. A process for producing an adsorbing cellulose microcapsule as claimed in claim 1, which comprises hydrolyzing ester groups of a cellulose ester derivative microcapsule, consisting of an outer barrier layer of cellulose ester derivative having micropores and adsorbent powders which are dispersed within cellulose ester derivative gel matrix innerside of said barrier layer.

4,118,337

METHOD FOR REGENERATING FLUIDIZABLE SOLID PARTICLES EMPLOYED IN HYDROCARBON CONVERSION

Benjamin Gross, Cherry Hill, and Klaus Wilhelm Schatz, Paulsboro, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 20, 1977, Ser. No. 807,776
Int. Cl.[2] B01J *29/38, 21/20;* **C10G** *11/18, 11/04*
U.S. Cl. 252—417 **10 Claims**



1. In a fluid catalyst operation comprising conversion of hydrocarbons to lower and higher boiling products and regeneration of catalyst employed in said hydrocarbon conversion, the method for regenerating catalyst particles comprising carbonaceous material deposits which comprises

passing spent catalyst into an annular catalyst regeneration zone about the periphery of an inner concentric catalyst regeneration zone,

admixing hot freshly regenerated catalyst particles obtained from said concentric zone with said spent catalyst in said annular zone in an amount sufficient to raise the temperature of said spent catalyst to a temperature promoting the combustion of carbonaceous material in the presence of oxygen containing regeneration gas,

causing said mixture of spent and regenerated catalyst to flow as a suspension in combustion supporting gases generally upwardly through vertical sections of said annular zone during combustion of carbonaceous material with controlled amounts of introduced combustion supporting gas, discharging the suspension from the top of said annular zone through an annular passageway into a dispersed phase of catalyst above said concentric catalyst regeneration zone for flow generally downwardly therethrough as a dense flowing bed of catalyst and countercurrent to rising regeneration gas,

introducing combustion supporting regeneration gas to a bottom portion of said concentric downwardly flowing bed of catalyst beneath the inlet of a regeneration catalyst withdrawal zone,

passing regenerated catalyst from a lower portion of said concentric bed through said withdrawal zone to a hydrocarbon conversion zone,

separating particles of catalyst from combustion gases in said dispersed phase above said concentric bed of catalyst, withdrawing said combustion gases and

passing catalyst separated in said dispersed phase into said concentric bed.

6. The method of claim 1 wherein the spent catalyst is introduced tangentially to said annular zone.

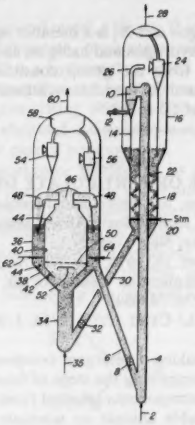
7. The method of claim 1 wherein regeneration of the catalyst is accomplished under conditions promoting the combustion of CO.

4,118,338

METHOD FOR REGENERATING A FLUID CRACKING CATALYST

Benjamin Gross, Cherry Hill, and Klaus Wilhelm Schatz, Wenonah, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 1, 1977, Ser. No. 829,845
Int. Cl.[2] B01J *29/38, 21/20;* **C10G** *11/18, 11/04*
U.S. Cl. 252—417 **8 Claims**



1. In a hydrocarbon conversion-catalyst regeneration operation employing fluidized catalyst particles comprising a crystalline zeolite wherein catalyst particles comprising carbonaceous deposits are recovered from hydrocarbon conversion and passed to a catalyst regeneration operation to remove carbonaceous deposits by burning thereby heating the catalyst particles to an elevated temperature within the range of 1200° F. to 1500° F. and catalyst particles thus heated are returned to the hydrocarbon conversion operation, the improved method for regenerating the catalyst particles which comprises,

forming a suspension of spent catalyst particles comprising carbonaceous deposits in upflowing gaseous material passing upwardly through a first riser zone communicating with the bottom open end of a larger diameter cylindrical combustion zone for burning carbonaceous material,

recovering regenerated catalyst in an annular zone about said cylindrical zone, passing regenerated catalyst from the bottom of said annular zone in admixture with said catalyst suspension adjacent the upper end of said first riser zone and before passage into the bottom open end of said larger diameter cylindrical combustion zone,

passing a mass of regenerated catalyst particles in admixture with spent catalyst upwardly through said combustion zone under conditions supporting combustion of carbon

containing material thereby heating said catalyst particles to a temperature above 1200° F.,

separating catalyst particles thus regenerated from gaseous combustion products following upward flow through said larger diameter combustion zone, recovering hot regenerated catalyst thus separated in said annular zone, and

maintaining a catalyst head of pressure between said annular zone and said cylindrical zone to maintain a flow of hot regenerated catalyst from said annular zone into the bottom open end of said larger diameter cylindrical zone to form a mix temperature with carbon containing catalyst particles suspended in oxygen containing gas sufficient to particularly promote the combustion of carbon material in the presence of oxygen containing regeneration gas.

6. The method of claim 1 wherein regenerated catalyst is mixed with catalyst containing carbonaceous deposits passed to said first riser zone.

8. The method of claim 1 wherein a suspension of hot combustion products and regenerated catalyst particles is discharged from the upper end of said combustion zone generally downward into said annular zone.

4,118,339

USE OF NOBLE METAL SOLUTIONS IN CATALYST REGENERATION ZONES

Edwin J. Latos, Chicago, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 737,355, Nov. 1, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,670

Int. Cl.[2] **B01J** *21/20, 29/38;* **C10G** *11/04*

U.S. Cl. 252—417 **12 Claims**

1. A method for regenerating coke-contaminated fluidized catalytic cracking catalyst which has become spent as a result of its use in a hydrocarbon cracking reactor containing from about 0.5 to about 1.5 wt. % coke with simultaneous carefully-controlled oxidation of CO to CO_2 which comprises the steps of:

(a) introducing said coke-contaminated cracking catalyst into a fluidized catalytic cracking catalyst regeneration zone;

(b) passing into said regeneration zone, independently of said coke-contaminated cracking catalyst and free of the reactor feed stock, a CO oxidation promoter solution, to promote oxidation of CO to CO_2, in an amount equivalent to from about 0.1 to about 30 ppm of the circulating catalyst inventory on an elemental metal basis, said solution comprising a noble metal compound dissolved in a solvent selected from the group consisting of saturated aliphatic alcohols having from 2 to 8 carbon atoms per molecule and possessing a freezing point of 32° F. or less;

(c) passing into said regeneration zone an oxygen-containing regeneration gas in an amount selected to burn coke from said coke-contaminated cracking catalyst and to provide sufficient excess oxygen to effect the desired amount of CO oxidation;

(d) reacting a first portion of said oxygen-containing regeneration gas with said coke-contaminated cracking catalyst in said regeneration zone at oxidation conditions including a temperature within the range of from about 1100° F. to about 1450° F. and a pressure within the range of from about atmospheric to about 50 psig selected to remove coke from said coke-contaminated catalyst and to produce a flue gas containing CO and sufficient to cause combination of CO and CO_2 in the presence of said oxidation promoter, thereby producing regenerated catalyst and flue gas; and,

(e) simultaneously contacting said flue gas and a second portion of said oxygen-containing regeneration gas with said CO oxidation promoter in said regeneration zone in the presence of said regenerated catalyst at a temperature within the range of from about 1100° F. to 1450° F. and a pressure within the range of from about atmospheric to about 50 psig to effect a controlled quantity of exothermic heat of reaction and to decrease the amount of CO in said flue gas.

9. A method of regeneration as set forth in claim 1 wherein the concentration of said noble metal in said promoter solution is equivalent to from about 0.01 to about 10 wt. % elemental metal.

4,118,340

NOVEL POLYMERIZATION CATALYST

Louis J. Rekers, Wyoming, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jun. 7, 1976, Ser. No. 693,803

Int. Cl.[2] **C08F** *4/78, 4/22, 4/24*

U.S. Cl. 252—428 **21 Claims**

1. An olefin polymerization catalyst composition comprising a solid inorganic support material having deposited thereon a preformed organoborate-chromium product obtainable by the reaction of chromium trioxide and a trihydrocarbyl borate, said composition having been heated in a dry non-reducing atmosphere at a temperature above about 400° F. and below the temperature at which the structure of the support is impaired, and for a period of time sufficient to promote the polymerization activity of said catalyst composition for the polymerization of 1-olefins.

4,118,341

ACTIVATED CARBON

Katsuji Ishibashi, Sapporo; Shigeo Mitsui, Ebetsu, and Rikio Kobayashi, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 562,248, Mar. 26, 1975, abandoned. This application Apr. 5, 1977, Ser. No. 784,947

Claims priority, application Japan, May 27, 1974, 49-59065

Int. Cl.[2] **B01J** *27/20, 27/24, 21/18*

U.S. Cl. 252—438 **6 Claims**

1. A method of manufacturing activated carbon which comprises:

(a) thermally condensing a polymer of acrylonitrile at a temperature between 150° and 500° C. for 3 hours to 2 minutes in an oxidizing atmosphere until a black condensation product is formed;

(b) heating said product at 550° to 950° C. in an atmosphere consisting essentially of at least one member of the group consisting of steam and carbon dioxide until an activated carbon capable of absorbing butyl mercaptan in an amount of more than 100% of the weight of said activated carbon is formed; and

(c) recovering said activated carbon.

4,118,342

PROCESS FOR PRODUCING CATALYSTS

Henri R. Debus, Meise, and Raymond M. Cahen, Brussels, both of Belgium, assignors to Labofina S. A., Brussels, Belgium

Filed Jun. 21, 1977, Ser. No. 808,624

Int. Cl.[2] **B01J** *27/02;* **C11C** *3/12*

U.S. Cl. 252—439 **17 Claims**

1. A process for producing a partially sulfurized nickel hydrogenation catalyst adapted for selective hydrogenation of unsaturated higher fatty acid compounds with reduction of the content of polyenic compounds, limitation of the formation of saturated compounds and of conjugated dienic compounds and with isomerization to trans-isomers, which comprises the step of treating a pre-reduced nickel catalyst comprising nickel, having a crystallite size of between about 10 and about 200 A with at least one organic sulfur compound selected from the group consisting of thiophene, alkylthiophenes, mono- and disulfides and mercaptans at a temperature of between about 75° C. and about 200° C. at a hydrogen pressure sufficient and for a period of time sufficient to produce a partially sulfurized

nickel hydrogenation catalyst containing from about 1.5 to about 8 parts by weight of sulfur per 100 parts by weight of nickel.

4,118,343

TRICYCLO[6.2.1.0^{2,7}]UNDEC-9-EN-3-ONE PERFUME COMPOSITION

Werner Skorianetz, Dardagny, Geneva, and Günther Ohloff, Bernex, Geneva, both of Switzerland, assignors to Firmenich, S.A., Geneva, Switzerland

Filed Aug. 15, 1977, Ser. No. 824,905

Claims priority, application Switzerland, Aug. 20, 1976, 10606/76

Int. Cl.^{2} C11B *9/00*

U.S. Cl. 252—522 **3 Claims**

1. A perfume composition containing as an active ingredient tricyclo [6.2.1.0^{2,7}]undec-9-en-3-one in combination with a diluent.

4,118,344

DRYCLEANING DETERGENT SOLUTION

Harold D. DeShon, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 688,803, May 21, 1976, abandoned. This application Jun. 23, 1977, Ser. No. 809,502

Int. Cl.^{2} C11D *1/83, 7/30, 7/50*

U.S. Cl. 252—559 **7 Claims**

1. A composition consisting essentially of a drycleaning solvent having dissolved therein about 0.1–4 percent by weight of an alkali metal petroleum sulfonate and about 0.01–0.4 percent by weight of a polyoxyalkylene glycol having an average molecular weight of from about 10,000 to about 100,000 and wherein the polyoxyalkylene glycol contains about 95–5 mole percent oxyethylene units and about 5–95 mole percent oxypropylene units.

4,118,345

RECOVERY OF POLYACETAL RESINS

Michael A. Hanley; Lawrence A. Miller, both of Reading, and Irvin H. Kinsey, Saegertown, all of Pa., assignors to The Polymer Corporation, Reading, Pa.

Filed Jan. 18, 1977, Ser. No. 760,319

Int. Cl.^{2} C08J *11/04;* **C08L** *59/02*

U.S. Cl. 260—2.3 **5 Claims**

1. In a method for the recovery of polyacetal scrap material in which extraneous dirt, if any, is removed from the scrap, the scrap is coarsely ground to a size convenient to feed to a screw extruder, the scrap is melted in the extruder, strands are extruded from the extruder, and the strands are chopped to form a molding powder, the improvement comprising melt mixing with the polyacetal scrap material in the extruder between about 1 to about 10 weight percent of a polysiloxane fluid.

4,118,346

PHENOLIC RESIN RECOVERY PROCESS

Robert Milton Summers, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 27, 1977, Ser. No. 864,350

Int. Cl.^{2} B29H *19/00;* **C08J** *11/04*

U.S. Cl. 260—2.3 **10 Claims**

1. A process for recovering a resin type material from an infusible phenolic plastic, comprising the steps of:

placing a quantity of said infusible phenolic plastic in a container;

adding an alkali solution to said infusible phenolic plastic to create a mixture;

heating said mixture to a temperature between 260°–340° C causing at least a portion of said infusible phenolic plastic to dissolve into said alkali solution to create a liquor;

filtering said liquor from said mixture to remove any undissolved infusible phenolic plastic and other insoluble materials therefrom; and

acidifying said liquor by adding an acid solution thereto causing a phenolic type resin material therein to precipitate therefrom as a solid.

4,118,347

FILLER FOR LIQUID CHROMATOGRAPHY

Susumu Ishiguro; Masuhiro Komuro, and Shigeru Nakamura, all of Yokohama, Japan, assignors to Showa Denko K.K., Japan

Filed Jun. 15, 1977, Ser. No. 806,842

Claims priority, application Japan, Jun. 25, 1976, 51-74401

Int. Cl.^{2} C08J *9/16, 9/20, 9/36*

U.S. Cl. 521—53 **12 Claims**

1. A granular filler for liquid chromatography consisting essentially of a porous copolymer of (A) a glycidyl monovinyl ester or a glycidyl monovinyl ether and (B) an alkylene glycol divinyl ester with component (A) being crosslinked by component (B) to form a gel copolymer, the mole ratio of component (A) to component (B) being 10:90 to 90:10, said copolymer containing in its molecule modified groups resulting from the ring-opening reaction of the epoxy groups ascribable to component (A) with a modifying compound selected from the group consisting of water, alkylene glycol, polyalkylene glycol and a triol.

4,118,348

METHOD FOR PREPARING BLENDS OF RUBBER, A POLYPHENYLENE ETHER RESIN AND AN ALKENYL AROMATIC ADDITION POLYMER

James G. Bennett, Menands; Glenn D. Cooper, and Arthur Katchman, both of Delmar, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 1, 1973, Ser. No. 401,994

Int. Cl.^{2} C08L *7/00*

U.S. Cl. 260—4 AR **1 Claim**

1. A process for preparing a composition comprising:

(1) from 1–25 parts by weight of a rubber and from 5 to 95 parts by weight of alkenyl aromatic addition polymer component and

(2) from 10 to 90 parts by weight of a polyphenylene ether resin component, said process comprising:

a. providing a first mixture which consists essentially of a phenol, capable of oxidatively coupling to form said polyphenylene ether resin component and an alkenyl aromatic monomer capable of forming an addition polymer;

b. polymerizing said phenol by oxidative coupling in said first mixture in the presence of oxygen to produce a second mixture of said polyphenylene ether resin and said alkenyl aromatic monomer;

c. providing in said section mixture a quantity of a rubber to form a third mixture of said polyphenylene ether resin, said alkenyl aromatic monomer and said rubber; and

d. polymerizing said rubber and alkenyl aromatic monomer in said third mixture to form said composition of a rubber, an alkenyl aromatic addition polymer and a polyphenylene ether resin.

4,118,349

PROCESS FOR THE MANUFACTURE OF POLYSTYRENE LATEX COMPOUNDS

Ludwig Bonacker, Marbach near Marburg, Lahn, and Josef Stark, Marburg, Lahn, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Lahn, Fed. Rep. of Germany

Continuation of Ser. No. 546,904, Feb. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 252,028, May 10, 1972, abandoned. This application Jun. 30, 1977, Ser. No. 811,853

Claims priority, application Fed. Rep. of Germany, May 12, 1971, 212348

Int. Cl.[2] C08L *89/00*

U.S. Cl. 260—8 22 Claims

1. In a process for chemically bonding a protein or peptide to a polymeric carrier which is a styrene homopolymer or a copolymer of styrene with less than 50 percent by weight of acrylic acid or methacrylic acid by contacting (1) a homogeneous aqueous latex suspension of said polymeric carrier, (2) said protein or peptide, and (3) an aromatic diazonium compound at a weakly alkaline pH, the improvements which comprise contacting (1), (2) and (3) at a temperature below room temperature and subsequently adding albumin to the mixture to give an albumin concentration between 0.5 and 1.5 percent in the mixture.

4,118,350

CELLULOSE ACETATE SOLUTIONS CONTAINING METHYLOLATED POLYMERS

Albin F. Turbak, Convent Station; John P. Thelman, Kenvil, and Andrew B. Auerbach, Livingston, all of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 14, 1977, Ser. No. 833,077

Int. Cl.[2] C08L *1/12*

U.S. Cl. 260—15 10 Claims

1. A process for inhibiting the gelation of a cellulose acetate solution containing a methylolated polymer soluble in said solution and selected from the group consisting of melamine and guanamine polymers, comprising adding to said solution an amine oxide of the formula R_3NO wherein R is a hydrocarbon radical, the amount of amine oxide being at least about 0.5% by weight of the methylolated polymer.

4,118,351

TERPOLYAMIDE HOT MELT ADHESIVE

Christopher Linley Murray, Oldbury, and Corwyn Philip Vale, Brierley Hill, both of England, assignors to British Industrial Plastics Limited, Manchester, England

Filed Mar. 29, 1977, Ser. No. 782,409

Claims priority, application United Kingdom, Mar. 30, 1976, 12671/76

Int. Cl.[2] C08G *69/14*

U.S. Cl. 260—18 N 14 Claims

10. A polyamide terpolymer suitable for use as a hot melt adhesive and having a melting point within the range 95° C. to 135° C. and consisting essentially of units of the following materials, the amounts being expressed as percentage by weight of the terpolymer:

(i) from 45% to 50% by weight of ϵ-caprolactam or ϵ-aminocaproic acid

(ii) from 30% to 35% by weight of equimolar quantities of hexamethylene diamine and isophthalic acid

(iii) 20% by weight of equimolar quantities of hexamethylene diamine and adipic acid and

(iv) from 0.5 to 4.0% by weight of a chain terminator as a viscosity stabilizer.

4,118,352

ORGANIC PHOSPHITES, PROCESS FOR THEIR MANUFACTURE AND THEIR USE AS STABILIZERS

Härald Haberlein; Herbert Nies, and Franz Scheidl, all of Gersthofen, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

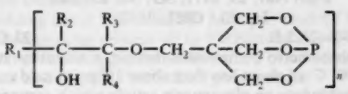
Filed May 12, 1977, Ser. No. 796,199

Claims priority, application Fed. Rep. of Germany, May 13, 1976, 2621323

Int. Cl.[2] C07F *9/15;* C08K *5/52*

U.S. Cl. 260—23 XA 5 Claims

1. Phosphites of the formula



wherein n is 1 or 2, and where n is 1, R_1–R_4 are identical or different and are

(a) 0–3 hydrogens

(b) phenyl or naphthyl, or cycloalkyl of 5–12 carbons or said radicals substituted by alkyl of 1–9 carbons or by 1–4 chlorines,

(c) linear or branched alkyl of 1–60 carbons or

(d) R_2 and R_3 are identical and are links of a saturated or unsaturated alkyl- or aryl substituted alkylene chain, the alkylene chain having 3–10 carbons,

and the sum of all carbons of R_1–R_4 being 4–60; and where n is 2, R_2, R_3 and R_4 are as defined above and R_1 is a bivalent organic radical which is

(a′) an alkylene chain of 1–10 carbons unsubstituted or substituted by methyl or ethyl,

(b′) a group of the formula

$$-CH_2-O-A-O-CH_2-$$

wherein A is

(α) phenylene or naphthylene unsubstituted or substituted by 1–2 alkyls of 1–4 carbons or by 1–2 halogens,

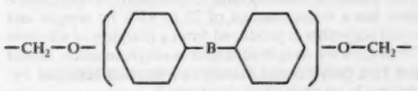
(β) a alkylene chain of 2–12 carbons unsubstituted or substituted by methyl or ethyl.

(γ) 1,3 or 1,4-dimethylene cyclohexane,

(δ)αω-diacylalkylene of 3–12 carbons unsubstituted or substituted by methyl or ethyl, or

(ϵ) diacylphenylene or diacylnaphthylene,

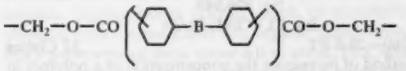
(c′) a group of the formula



wherein B is —O—, —S—, —CO—, $-SO_2$ or

wherein D and E are identical or different and are hydrogen, alkyl of 1–6 carbons, or common members of an alkylene chain of 4–6 carbons, or

(d′) a group of the formula



wherein B is as defined in (c′) above; and the sum of all carbons in R_1–R_4 is 4–60.

3. A plastic molding composition consisting essentially of an

organic polymer selected from the group consisting of chloropolyethylene, polyvinylchloride, polyvinylidene chloride, polyvinylchloroacetate, vinylchloride-α-olefin copolymers, and polymers or copolymers of olefins free from halogen, and as stabilizer a phosphite of claim 1 in an amount of 0.1–10 parts by weight relative to 100 parts by weight of polymer.

4,118,353

ELASTOMERIC COMPOSITIONS

Henry S. Makowski, Scotch Plains, and Charles P. O'Farrell, Clark, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 29, 1977, Ser. No. 855,545

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—28.5 B **23 Claims**

1. An elastomeric composition having a viscosity at 0.73 sec^{-1} at 200° C. of about less than about 10^5 poise, said composition formable into an elastomeric article which comprises:

(a) 100 parts by weight of a neutralized sulfonated elastomeric polymer having about 10 to about 50 meq. metal neutralized sulfonate groups per 100 grams of said sulfonated elastomeric polymer, a metal counterion of said metal sulfonated groups being selected from the group consisting essentially of antimony, iron, aluminum, lead, Groups I-A, II-A, I-B, II-B of the Periodic Table of Elements and mixtures thereof;

(b) about 25 to about 150 parts per hundred of a non-polar process oil;

(c) about 25 to about 200 parts per hundred of a filler; and

(d) about 2 to about 50 parts per hundred of a hydroxyl alkyl carboxylate ester.

4,118,354

POLYURETHANE HYDROGEL AND METHOD FOR THE PRODUCTION OF THE SAME

Hideo Harada, Nagaokakyo, and Nobuaki Matsushita, Kyoto, both of Japan, assignors to Dai-Icni Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 418,181, Nov. 23, 1973, abandoned. This application Aug. 17, 1976, Ser. No. 715,056

Claims priority, application Japan, Nov. 24, 1972, 47-118321

Int. Cl.[2] B01D *53/02*; C08G *18/32*; C08J *3/06*

U.S. Cl. 260—29.2 TN **20 Claims**

1. A polyurethane hydrogel obtained by dispersing:

(a) a reaction product obtained by the reaction of polyisocyanate having at least two isocyanate groups with a polyether into

(b) an aqueous liquid phase;

wherein the amounts of said (a) and (b) are such that the hydrogel product has a water content of 70 to 95% by weight and wherein said polyether is produced from a plurality of alkylene oxides, 75 to 85% by weight of which is ethylene oxide, added at random to a polyalcohol having at least two terminal hydroxyl groups in an amount to produce an average molecular weight of 2000 to 3000 per said terminal hydroxyl group of said polyalcohol.

4,118,355

METHOD AND COMPOSITION OF A POLYMER IN CONVENIENT LIQUID FORM

Norman Vorchheimer, Buckingham, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 791,742, Apr. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 695,510, Jun. 11, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 896,949

Int. Cl.[2] C08L *33/26*

U.S. Cl. 260—29.6 PT **32 Claims**

1. A method of increasing the concentration of a polymer in a first solvent in which it is soluble comprising forming a solution of the polymer with the first solvent and a second solvent which is cosoluble with the first solvent and in which the polymer is not soluble, wherein the solution is formed by forming an initial solution of the first and second solvents and adding the polymer thereto.

4,118,356

COPOLYMERS OF ETHYLENE AND VINYL ACETATE OF INCREASED INSOLUBILITY

James E. Devona, Hoffman Estates, and Abdullah M. Rokadia, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Dec. 18, 1973, Ser. No. 426,285

Int. Cl.[2] C08L *31/04, 23/08, 27/06*

U.S. Cl. 260—29.6 RB **8 Claims**

1. A method of copolymerizing ethylene and vinyl acetate to produce a copolymer containing 5–40% ethylene exhibiting increased insolubility in acetone and aqueous caustic comprising copolymerizing ethylene and vinyl acetate monomers in an aqueous emulsion further containing at least 10% by weight of emulsified particles of a copolymer of at least 50% by weight of copolymerized vinyl acetate and 5–40% by weight of copolymerized ethylene, said vinyl acetate and ethylene monomers being present in the emulsion in an amount of at least 10% by weight of unreacted monomers in the emulsion, and said emulsion also containing redox catalysts to cause the unreacted monomers to copolymerize in a vigorous exothermic reaction.

4,118,357

ADHESIVE AQUEOUS DISPERSIONS OF POLYVINYL ALCOHOL GRAFT POLYMERS WITH ACIDIC HARDENERS AND PROCESS OF PRODUCTION

Hartmut Brabetz; Christof Kemenater; Franz Six, and Wilhelm Kaiser, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed May 2, 1977, Ser. No. 792,682

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620 738

Int. Cl.[2] C09J *3/14*

U.S. Cl. 260—29.6 WA **15 Claims**

1. An aqueous copolymer dispersion useful for adhesives of increased waterproofness when hardened with an acid hardener selected from the group consisting of water-soluble acids with pKs of under 0 and salts of monobasic acids having pKs of under 0 with heavy metals selected from the group consisting of Cr^{III}, Al^{III}, and Fe^{III}, and zirconyl salts of monobasic acids having pKs of under 0, and mixtures thereof consisting essentially of aqueous dispersions of pre-crosslinked polyvinyl esters grafted onto polyvinyl alcohol wherein said grafted polymer contains from 2% to 14% by weight of said polymer of a polyvinyl alcohol with a degree of hydrolysis of between 74 and 97 mol % having grafted thereon (1) at least 70% by weight of said polymer of a vinyl ester selected from the group consisting of vinyl esters of alkanoic acids having from 1 to 12 carbon atoms and mixtures thereof, (2) from 0 to 10% by weight of said polymer of at least one monoethylenically-unsaturated compound copolymerizable with said vinyl ester and (3) from 0.01% to 5% by weight of at least one compound having at least two ethylenically-unsaturated bonds and being copolymerizable with said vinyl ester, said aqueous dispersion having a solids content of from 40% to 60% by weight.

4,118,358

PREPARATION OF OXADIAZOLE COPOLYMER SOLUTION FROM SCRAP COPOLYMER

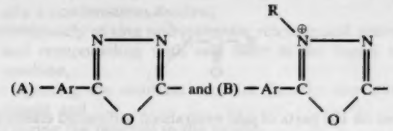
Frank M. Silver, and Hartwig C. Bach, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 10, 1977, Ser. No. 776,335

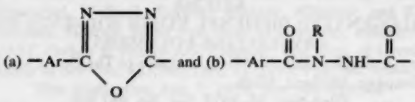
Int. Cl.[2] C08K *5/41*

U.S. Cl. 260—30.8 R **10 Claims**

1. A process for preparing a sulfuric acid solution of a copolymer consisting essentially of recurring structural units of the formulas



in a mole ratio in the range of 20:80 to 95:5, respectively, where Ar is a divalent aromatic radical and R is a C_1 to C_4 alkyl, comprising, degrading in oleum scrap copolymer consisting essentially of recurring structural units of the formulas



in a mole ratio in the range of 20:80 to 95:5, respectively, where Ar and R are as previously defined, with stirring until a solution is obtained and then heating said solution at a temperature between about 100° and 160° C. with stirring for a period of time sufficient to provide a fiber forming polymer solution.

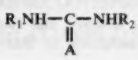
4,118,359

PLASTICIZATION OF NEUTRALIZED SULFONATED ELASTOMERIC POLYMER

Douglas Brenner, Livingston, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 29, 1977, Ser. No. 855,693
Int. Cl.[2] C08K *5/36*
U.S. Cl. 260—30.8 R **10 Claims**

1. An elastomeric composition including:
(a) 100 parts by weight of a neutralized sulfonated elastomeric polymer having at least about 15 meq. neutralized sulfonate groups per 100 grams of said sulfonated elastomeric polymer, said neutralized sulfonate groups being neutralized with metal cations, ammonium ion or amine; and
(b) at least about 5 parts by weight of an organic urea or thiourea having the formula



based on 100 parts of said neutralized sulfonated elastomeric polymer, wherein A is selected from the group consisting of oxygen and sulfur and R_1 and R_2 are independently selected from the group consisting of alkyl groups, aralkyl groups, and aryl groups, and wherein if R_1 and R_2 are alkyl groups, then at least one of them must be a C_{12} to C_{22} alkyl.

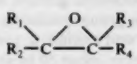
4,118,360

OIL EXTENDED ELASTOMERIC COMPOSITIONS

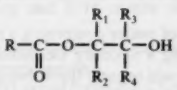
Henry S. Makowski, Scotch Plains, and Charles P. O'Farrell, Clark, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 29, 1977, Ser. No. 855,555
Int. Cl.[2] C08K *5/10*
U.S. Cl. 260—31.2 R **33 Claims**

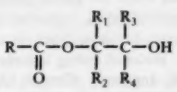
1. A process for the manufacture of a sulfonated elastomeric blend, which comprises the following steps:
(a) dissolving an elastomeric polymer in a solvent to form a cement;
(b) sulfonating with a sulfonating agent said elastomeric polymer in said cement to form an acid form of a sulfonated elastomeric polymer;
(c) reacting said acid form of said sulfonated elastomeric polymer with an oxirane to form a hydroxyalkylated sulfonated polymer, said oxirane having the general formula:



wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting essentially of hydrogen and C_1 to C_{18} straight and branched chain acyclic, alicyclic, aryl, alkylaryl, arylalkyl radicals and their functional derivatives;
(d) recovering said hydroxyalkyl sulfonated polymer from said cement;
(e) adding about 5 to about 200 parts per hundred by weight of a non-polar process oil to 100 parts of said hydroxyalkylated sulfonated polymer to form a blend of said oil and said hydroxyalkyl sulfonated polymer; and
(f) reacting said blend of said oil and said hydroxyalkyl sulfonated polymer with a metal containing base to form a neutralized sulfonated elastomeric polymer and a hydroxyalkyl carboxylate ester having the formula:



21. A solid, gel-free elastomeric blend composition consisting essentially of:
(a) 100 parts by weight of a neutralized sulfonated elastomeric polymer having about 10 to about 50 meq. of sulfonate groups per 100 grams of said polymer, at least 90 percent of said sulfonate groups being neutralized with a metal counterion;
(b) about 2 to about 50 parts per hundred of a hydroxyalkyl carboxylate ester having the formula:



wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting of hydrogen, C_1 to C_{18} straight and branched chain acyclic, alicyclic, aryl, alkylaryl, and arylalkyl groups and functional derivatives thereof and mixtures thereof; and
(c) about 5 to about 200 parts per hundred of a process oil.

4,118,361

METHOD FOR CONTROLLING VISCOSITY OF ORGANIC LIQUIDS

Robert D. Lundberg, Somerville, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 470,806, May 17, 1974, Pat. No. 3,931,021. This application Nov. 17, 1975, Ser. No. 632,454
The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.
Int. Cl.[2] C08K *5/04, 5/16;* **F17D** *1/16, 1/17*
U.S. Cl. 260—31.8 G **15 Claims**

1. A method for controlling the viscosity of organic liquids having a viscosity measured at 100° F. of less than 35 SUS, said organic liquid being selected from the group consisting of aliphatic, aromatic and chlorinated hydrocarbons, alcohols, ketones, organic ethers, organic esters, or nitroderivatives of aliphatic hydrocarbons, and said organic liquid having a solubility parameter of from about 6.0 to about 10.5, which comprises incorporating in said organic liquid a minor amount of a multiphase ionomeric polymer and a polar cosolvent having a solubility parameter of from about 10 to about 20, said polar cosolvent being soluble or miscible with said organic liquid, the solubility parameter of said polar cosolvent being at least

1.0 unit higher than the solubility parameter of said organic liquid, said ionomeric polymer having from about 0.1 to about 25 mole % pendant ionomeric groups, said ionomeric groups being selected from the group consisting of carboxylate, phosphonate and sulfonate, said ionomeric groups being neutralized with a basic material from about 50 to about 500 mole %, said basic material being selected from the group consisting of lead, tin, antimony, Groups IA, IIA, IB or IIB of the Periodic Table of Elements, of polymeric backbone of said ionomeric polymer which is substantially soluble in said organic liquid, said backbone having a solubility parameter of less than about 10.5 and a crystallinity of less than about 25%, said ionomeric polymer being incorporated into said organic liquid at a level of from about 0.1 to about 20 weight % based on said organic liquid, said ionomeric polymer having a number average molecular weight from about 1,000 to about 10,000,000, said polar cosolvent comprising from about 0.1 to about 40 weight % of the total mixture of said organic liquid, said ionomeric polymer, and said polar cosolvent, said polar cosolvent having a boiling point of at least 50° C., said polar cosolvent being present in said mixture at about 10 to about 600 moles per mole of ionomeric groups.

9. A composition of matter comprising a major amount of an organic liquid having a viscosity measured at 100° F. of less than about 35 SUS, said organic liquid being selected from the group consisting of aliphatic, aromatic, and chlorinated hydrocarbons, alcohols, ketones, organic ethers, organic esters, or nitroderivatives of aliphatic hydrocarbons, and a minor amount of an ionomeric polymer and a polar cosolvent having a solubility parameter of from about 10 to about 20, the solubility parameter of said polar solvent being at least 1.0 unit higher than the solubility parameter of said organic liquid, said organic liquid having a solubility parameter of from about 6.0 to about 10.5, said ionomeric polymer having from about 0.1 to about 25 mole % pendant ionomeric groups, said ionomeric groups being selected from the group consisting of carboxylate, phosphonate, and sulfonate, said ionomeric groups being neutralized with a basic material from about 50 to about 500 mole %, said basic material being selected from the group consisting of lead, tin, antimony, Groups IA, IIA, IB or IIB of the Periodic Table of Elements, a polymeric backbone of said ionomeric polymer having a solubility parameter of less than about 10.5 and a crystallinity of less than about 25%, said ionomeric polymer being incorporated into said organic liquid at a level of from about 0.1 to about 20 weight % based on said organic liquid, said ionomeric polymer having a number average molecular weight from about 1,000 to about 10,000,000, said polar solvent comprising from about 0.1 to about 40 weight % of the total mixture of said organic liquid, said ionomeric polymer and said polar cosolvent, said polar solvent having a boiling point of at least 50° C.

4,118,362
PLASTICIZATION OF NEUTRALIZED SULFONATED ELASTOMERIC POLYMER

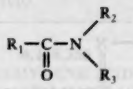
Henry S. Makowski, Scotch Plains, and Douglas Brenner, Livingston, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 29, 1977, Ser. No. 855,554
Int. Cl.² C08K 5/20
U.S. Cl. 260—32.6 A **18 Claims**

1. An elastomeric composition including:

(a) 100 parts by weight of a neutralized sulfonated elastomeric polymer having at least about 15 meq neutralized sulfonate groups per 100 grams of said sulfonated elastomeric polymer, said neutralized sulfonate groups being neutralized with metal cations, ammonium ion or amine; and

(b) at least about 8 parts by weight of an organic amide having the formula



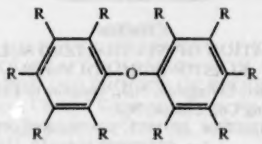
based on 100 parts of said neutralized sulfonated elastomeric polymer, wherein R_1 is an aliphatic radical and R_2 and R_3 are independently selected from the group consisting of H, alkyl, aryl or aralkyl wherein at least one of R_1, R_2 or R_3 has at least about 10 carbon atoms.

4,118,363
HALOGENATED DIPHENYL ETHER SOLVENTS FOR CRYSTALLINE POLYMERS

Harry A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 16, 1977, Ser. No. 851,909
Int. Cl.² C08K 5/06
U.S. Cl. 260—33.2 R **9 Claims**

1. A liquid solution comprising a crystalline polymer having a solubility parameter in the range from about 7 to about 12.5 in a diphenyl ether solvent having the formula



wherein each R is independently at least one member selected from the group consisting of hydrogen, halogen, and alkyl radicals, said alkyl radicals having up to 4 carbon atoms per radical and the total number of carbon atoms in all of said alkyl radicals being within the range from 0 to 8, and at least one of said R substituents is a halogen radical.

4,118,364
REINFORCED POLYHEXAMETHYLENE ISOPHTHALAMIDE

Werner Nielinger; Bert Brassat, and Hugo Vernaleken, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Jul. 22, 1977, Ser. No. 818,093
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 2647310
Int. Cl.² C08L 77/06
U.S. Cl. 260—37 N **7 Claims**

1. Polyhexamethylene isophthalamides containing from 5 to 50%, based on the mixture of polyamide and reinforcing material, by weight of a reinforcing material.

4,118,365
MOULDING THERMOSETTING COMPOSITIONS

Harold James, Hanbury, and Martin Buggy, Stourbridge, both of England, assignors to British Industrial Plastics Limited, Manchester, England

Filed Mar. 4, 1977, Ser. No. 774,494
Claims priority, application United Kingdom, Mar. 10, 1976, 09646/76
Int. Cl.² C08J 5/02
U.S. Cl. 260—39 R **12 Claims**

1. A method of producing moulded synthetic plastics artefacts by a continuous moulding sequence which comprises the successive steps of:

(a) providing in an injection moulding machine including a reciprocating rotary screw in a barrel, a blend of materials comprising a filler, and the solid precursors of a synthetic

amino-formaldehyde thermosetting material and optionally a condensation catalyst;
(b) intimately mixing said materials, reacting said precursors and compounding with said filler in the barrel of the machine,
(c) injecting the resultant material directly into a heated mould, and
(d) curing the material in the mould.

4,118,366

COMPOSITIONS FOR THE PRODUCTION OF OPAQUE COATINGS BY RADIATION

Horst Brose; Karl Dieter Depping, both of Hiltrup; Dietrich Hentschel, Wolbeck; Bernard Kostevc, Münster, and Klaus Schmidt, Hiltrup, all of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Münster, Fed. Rep. of Germany

Division of Ser. No. 423,745, Dec. 11, 1973, Pat. No. 3,984,584. This application Jun. 7, 1976, Ser. No. 693,964

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1972, 2263459

Int. Cl.[2] C08L *67/00*

U.S. Cl. 260—40 R **4 Claims**

1. A transparent coating composition which becomes opaque upon application to a substrate followed by exposure to radiation comprising:
A. about 14 to 20 parts by weight of an unsaturated polyester resin having a double bond value of about 0.180 to 0.450;
B. about 55 to 75 parts by weight of filler materials having refractive indices not exceeding 1.70;
C. about 0.5 to 10 parts by weight of resins selected from the group consisting of film forming cellulose derivatives or copolymers of vinyl chloride with other monomers compatible with component A; and
D. about 8 to 30 parts by weight of non-reactive solvents for the resins A and C.

4,118,367

REINFORCED RUBBER

Keith Dawes, and Roger James Rowley, both of London, England, assignors to The Malaysian Rubber Producers Research Association, England

Filed Jan. 27, 1977, Ser. No. 763,117

Claims priority, application United Kingdom, Feb. 6, 1976, 4802/76

Int. Cl.[2] C08K *5/54*

U.S. Cl. 260—42.37 **15 Claims**

1. A method of compounding rubber with silica which comprises including in the rubber a compound of the formula:

$$Y - X - CO - N = N - CO - X^1 - Z$$

where X and X^1 are the same or different and each is an imino group, an oxygen atom or a substituted or unsubstituted methylene group;
Y is a substituted or unsubstituted alkyl aryl or aralkyl group, or is the same as Z; and
Z is an alkyl, aryl or aralkyl group which has as substituent at least one silane group of the formula:
—-$Si(OR)_3$ or —$OSi(OR_3)$ in which R is a straight or branched chain alkyl group.

4,118,368

SYNTHETIC POLYMER STABILIZERS

Nobuo Soma; Syoji Morimura; Takao Yoshioka, and Tomoyuki Kurumada, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

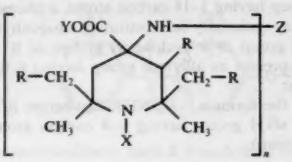
Filed Nov. 5, 1976, Ser. No. 739,055

Claims priority, application Japan, Nov. 11, 1975, 50-135516

Int. Cl.[2] C07D *211/00, 401/12;* **C08K** *5/34*

U.S. Cl. 260—45.8 N **9 Claims**

1. A synthetic polymer composition stabilized against photo- and thermal- deterioration, wherein there is incorporated, in an amount sufficient to prevent said deterioration, a piperidine derivative having the formula



(I)

and the acid-addition salts thereof, wherein:
R represents a hydrogen atom, or an alkyl group having 1–3 carbon atoms;
X represents a hydrogen atom,
an oxyl radical,
an alkyl group having 1–18 carbon atoms,
an alkenyl group having 3–6 carbon atoms,
a 2-propynyl group,
an alkoxyalkyl group having 1–3 carbon atoms in the alkyl moiety and 1–18 carbon atoms in the alkoxy moiety,
a cyanoalkyl group having 2–3 carbon atoms,
an 2,3-epoxypropyl group,
an aliphatic acyl group having 1–12 carbon atoms,
benzyl,
a group of the formula $—CH_2CH(R^1)OR^2$ (wherein R^1 represents a hydrogen atom, a methyl group or a phenyl group, and R^2 represents a hydrogen atom, or an aliphatic, aromatic, araliphatic or alicyclic acyl group having up to 18 carbon atoms),
a group of the formula $—CH_2COOR^3$ (wherein R^3 represents an alkyl group having 1–18 carbon atoms, an alkenyl group having 3–6 carbon atoms, a phenyl group, an aralkyl group having 7–8 carbon atoms, or a cyclohexyl group), or
a group of the formula $—COOR^4$ (wherein R^4 represents an alkyl group having 1–8 carbon atoms, a benzyl group, or a phenyl group);
Y represents an alkyl group having 1–18 carbon atoms,
an alkenyl group having 3–6 carbon atoms,
benzyl, or
an alkoxyalkyl group having a total of 2–4 carbon atoms;
$n = 1$, 2 or 3; and
when $n = 1$:
Z represents a hydrogen atom,
an alkyl group having 1–18 carbon atoms,
an alkenyl group having 3–4 carbon atoms,
an alkanoyl group having 2–18 carbon atoms,
an alkenoyl group having 3–5 carbon atoms,
a benzoyl group,
a benzyl group,
a phenylsulfonyl group,
a p-tolylsulfonyl group,
a methylcarbamoyl group, or
a phenylcarbamoyl group optionally substituted in its phenyl moiety with a chlorine atom or with an alkyl group having 1–4 carbon atoms,
a cinnamoyl group,
a 3-(3,5-di-t-butyl-4-hydroxyphenyl)propionyl group,
a phenylacetyl group,
a phenoxyacetyl group,
a cyclohexanecarbonyl group,
a group of formula $—CH_2CH_2OR^5$ (wherein R^5 represents a hydrogen atom, or an aliphatic, aromatic, araliphatic or alicyclic acyl group having up to 18 carbon atoms),
a group of the formula $—SO_2R^6$ (wherein R^6 represents an alkyl group having 1–3 carbon atoms, a phenyl group or a tolyl group),
a group of the formula $—COOR^7$ (wherein R^7 represents an alkyl group having 1–8 carbon atoms or a benzyl group),

a group of the formula —$CONR^8R^9$ (wherein R^8 represents a hydrogen atom or an alkyl group having 1–4 carbon atoms, and R^9 represents a hydrogen atom, an alkyl group having 1–18 carbon atoms, a phenyl group which may optionally be substituted, a naphthyl group, a benzyl group or a cyclohexyl group; or R^8 and R^9 jointly represent an alkylene group having 4–6 carbon atoms), or

a group of the formula —$CSNHR^{10}$ (wherein R^{10} represents an alkyl group having 1–4 carbon atoms or a phenyl group);

when $n = 2$:

Z represents an alkylene group having 1–10 carbon atoms,

a 2-butenylene group,

an m- or p- xylylene group,

a carbonyl group

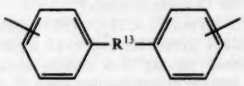
a sulfinyl group,

a sulfonyl group,

an oxalyl group,

a group of the formula —CO—R^{11}—CO— (wherein R^{11} represents an alkylene group having 1–10 carbon atoms which may optionally be interrupted by a sulfur atom; an alkenylene group having 2–4 carbon atoms; an arylene group having 6 or 10 carbon atoms in its aryl moiety; or a cyclohexylene group), or

a group of the formula —CONH—R^{12}—NHCO— [wherein R^{12} represents an alkylene group having 2–8 carbon atoms; a phenylene group; a tolylene group; a naphthylene group; a xylylene group; a group of the formula

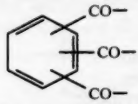


(wherein R^{13} represents an oxygen atom or a methylene group), or a group of the formula

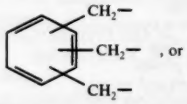
(wherein R^{14} represents a hydrogen atom or a methyl group)];

when $n = 3$:

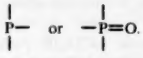
Z represents a group of formula



a group of the formula



a group of the formula



4,118,369

2,2,6,6-TETRASUBSTITUTED-4-PIPERIDYL CARBOXY HETEROCYCLIC COMPOUNDS AS STABILIZERS FOR SYNTHETIC POLYMERS

Motonobu Minagawa, Kosigaya; Naohiro Kubota, Urawa, and Toshihiro Shibata, Tsuji Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jul. 28, 1976, Ser. No. 709,561

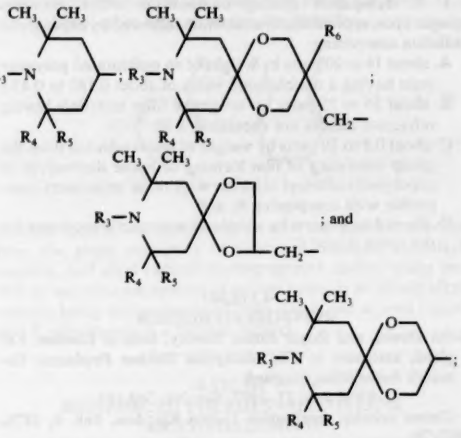
Int. Cl.[2] C08K *5/34;* C07D *401/00, 251/00*

U.S. Cl. 260—45.8 N 30 Claims

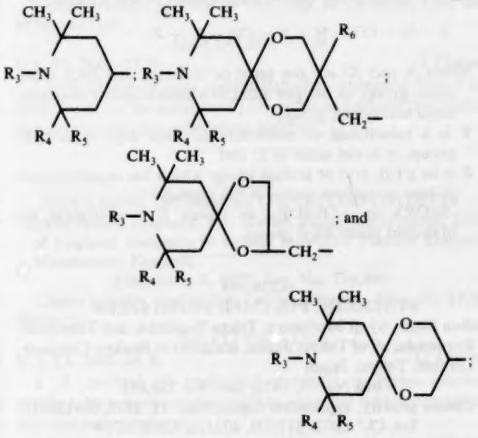
1. A 2,2,6,6-tetrasubstituted-4-piperidyl carboxy heterocyclic compound having the general formula:

wherein:

R_1 is selected from the group consisting of

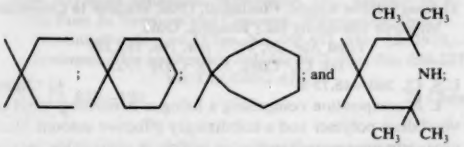


R_2 is selected from the group consisting of hydrogen; alkyl; alkenyl; alkynyl; aralkyl; aryl;



R_3 is selected from the group consisting of hydrogen; oxo; halogen; alkyl; alkenyl; alkynyl; aralkyl and aryl;

R_4 and R_5 are selected from the group consisting of alkyl and R_4 and R_5 taken together to form



R_6 is lower alkyl;

a is selected from the group consisting of 1, 2 and 3;

b is selected from the group consisting of 0, 1 and 2;

Z represents a heterocyclic ring having from three to six ring atoms of which one to three aee nitrogen, any remaining ring atoms being carbon atoms;

m is selected from the group consisting of 1, 2 and 3;

Y_1 and Y_2 are bivalent linking groups selected from the group consisting of alkylene and alkyleneoxyarylene, the alkylene having from one to four carbon atoms; and

n_1 and n_2 are 0 or 1.

21. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F, comprising a polyvinyl chloride resin formed at least in part of the recurring group

and having a chlorine content in excess of 40 percent, where X is either hydrogen or chlorine; and an amount to improve resistance to deterioration of the resin of a compound in accordance with claim **1**.

4,118,370

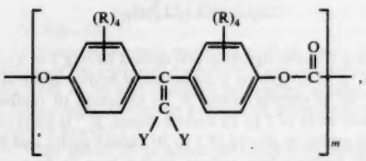
COLOR-STABILIZED HALOBISPHENOL ETHYLENE POLYCARBONATES

Keith N. Sannes, Schenectady, and Arnold Factor, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 22, 1976, Ser. No. 668,858
Int. Cl.[2] **C08K** *5/34, 5/10*
U.S. Cl. 260—45.75 W **9 Claims**

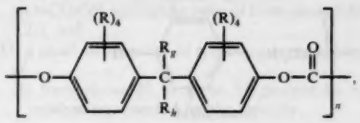
1. A thermally stable, color-stabilized halobisphenolethylene polycarbonate comprising:

(I) from (a) about 1–100 parts by weight of polycarbonate halobis(phenyl)ethylene units of formula (A):



(A)

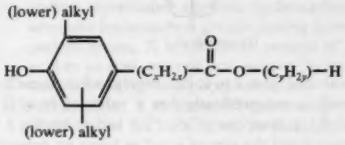
where independently each R is hydrogen, chlorine, bromine or a C_{1-30} monovalent hydrocarbon or hydrocarbonoxy group, each Y is hydrogen, chlorine or bromine, subject to the proviso that at least one Y is chlorine or bromine, and *m* is an integer of at least 2, to (b) about 99–0 parts by weight of a polycarbonate containing units of formula (B):



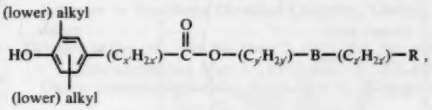
(B)

where independently each R is as defined hereinbefore, and independently R_g and R_h are hydrogen or a C_{1-30} monovalent hydrocarbon group, *n* is an integer of at least 2, and

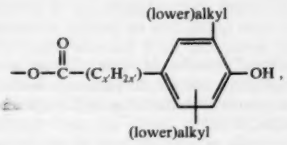
(II) an effective amount of a stabilizing component comprising an esterified hindered phenol of the formulas:



in which *x* has a value of from 0 to 6, inclusively, and *y* has a value of from 6 to 30, inclusively;

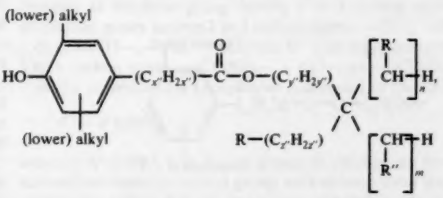


wherein *x'* has a value of from 0 to 6, inclusively, each of *y'* and *z'* has a value of from 2 to 20, inclusively, R is a member consisting of hydrogen, alkanoyloxy or

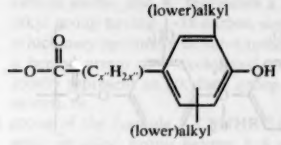


B is a member consisting of a divalent oxygen atom or the group

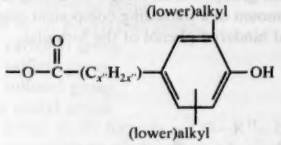
in which A is alkyl or alkanoyl; and



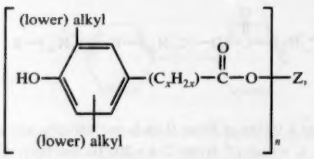
in which R is hydrogen, alkanoyloxy, or



each of R′ and R″ is alkanoyloxy or



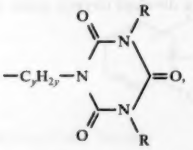
x'' has a value of from 1 to 6, inclusively, wherein each of y'', z'', n and m independently has a value of from 0 to 6, inclusively, at least one of y'', z'', n and m having a value other than 0 and the sum of n and m being no greater than 6 and being at least 1 when R is hydrogen and the sum of y'' and z'' being at least 1 when R is other than hydrogen, and



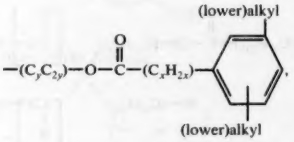
wherein x has a value of from 1 to 6, n has a value of from 2 to 6, Z is an aliphatic hydrocarbon of the formula:

$$C_yH_{2y+2-N},$$

in which y has a value of from 2 to 18 when n is 2 and a value of 3 to 6 when n is greater than 2, the value of y in all cases being equal to or greater than that of n, or Z is a heterocyclic of the formula:



in which y has a value of from 1 to 6, R is a member consisting of alkyl or



in which x has a value of from 1 to 6 and y has a value of from 1 to 6.

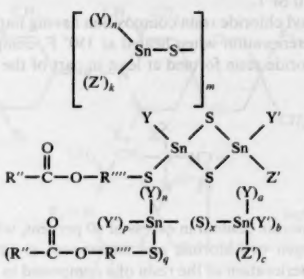
4,118,371

ORGANOTIN MERCAPTOALKANOL ESTER SULFIDE STABILIZERS FOR PVC RESINS

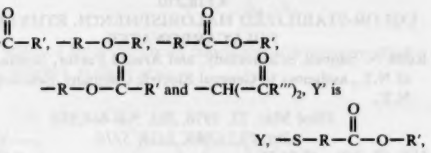
Thomas Gordon Kugele, Cincinnati, Ohio, assignor to Cincinnati Milacron Chemicals Inc., Reading, Ohio

Filed Apr. 29, 1977, Ser. No. 792,257
Int. Cl.[2] C08K 5/58; C07F 7/22
U.S. Cl. 260—45.75 S **43 Claims**

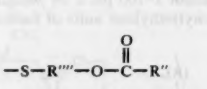
1. A composition comprising a halogen containing vinyl or vinylidene polymer and a stabilizingly effective amount of an organotin mercaptoalkanol ester sulfide or polysulfide having at least one sulfide or polysulfide bridged tin to tin group, at least one mercaptoalkanol ester group bonded to a sulfide or polysulfide bridged tin atom through the sulfur atom of the mercaptoalkanol moiety and at least one oxygen containing organic group bonded to a sulfide or polysulfide bridged tin atom through carbon said oxygen containing organic group being an organic group having a carbon oxygen bond, wherein the organotin mercaptoalkanol ester sulfide or polysulfide has the following formula



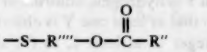
wherein a is 0 to 2, b is 0 to 2, c is 1 or 2, $a+b+c$ is 3, k is 1 or 2, m is 3, n is 1 or 2, p is 0 or 1, q is 1 or 2, $n+p+g$ is 3, x is 1 or 2, $n+k$ is 2 or 3, Y is a member selected from the group consisting of



halogen of atomic weight 35 to 127, or alkyl of 1 to 18 carbon atoms, Z′ is



or Y′, R is a bivalent hydrocarbon radical having 1 to 4 carbon atoms, R′ is hydrogen or a monovalent hydrocarbon radical having 1 to 20 carbon atoms, R″ is saturated or olefinically unsaturated alkyl of 1 to 20 carbon atoms, R‴ is alkyl of 1 to 20 carbon atoms or alkoxy of 1 to 20 carbon atoms and R⁗ is a bivalent hydrocarbon radical having two to four carbon atoms, with the proviso that in formula (I) at least one Z′ is

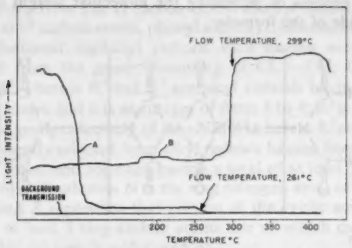


and the tin is tetravalent.

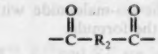
4,118,372
AROMATIC COPOLYESTER CAPABLE OF FORMING AN OPTICALLY ANISOTROPIC MELT

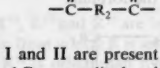
John Raymond Schaefgen, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 468,697, May 10, 1974, abandoned. This application Jul. 16, 1975, Ser. No. 596,237
Int. Cl.[2] C08G *63/18*
U.S. Cl. 528—190 20 Claims



1. A fiber-forming, melt spinnable (co) polyester capable of forming an optically anisotropic melt and consisting essentially of recurring units selected from the group consisting of





wherein units I and II are present in substantially equimolar amounts; R_1 and R_2 are radicals selected from the group of 1) single and fused six-membered aromatic carbocyclic ring systems wherein the chain extending bonds of the ring system, if attached to the same ring, are positioned 1,4- to each other, and if attached to different rings, are in positions parallel and oppositely directed, and 2) multiple six-membered aromatic carbocyclic ring systems in which the individual rings are joined by a chemical bond or a trans-vinylene group, and in which the chain extending bonds of each ring are in the 1,4-positions; and with the proviso that R_2 is unsubstituted in homopolymers of units I and II, said (co)polyester having a flow temperature in the range of 200° C to 375° C.

4,118,373
PREPARATION OF URETHANE ELASTOMERS FROM EPOXY RESIN, POLYOLS AND POLYISOCYANATES USING A CATALYST COMPOSITION OF AN ORGANOMETAL SALT WITH EITHER NITROGEN OR PHOSPHORUS COMPOUNDS

Jon A. Orvik, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 4, 1977, Ser. No. 793,569
Int. Cl.[2] C08G *18/18*
U.S. Cl. 528—73 3 Claims

1. Urethane elastomers modified with an epoxy resin which results from the curing of a mixture of components comprising

(A) from about 3 to about 30 percent by weight of a liquid epoxy resin having an average of more than one vicinal epoxy group;

(B) from about 35 to about 60 percent by weight of of a polyol composition containing

(1) a liquid polyether polyol or mixture of such polyols having an average functionality of from about 2 to about 3 and an average hydroxyl equivalent weight of from about 500 to about 2000, and

(2) a liquid low molecular weight diol having an average equivalent weight of from about 30 to about 90 wherein components (1) and (2) are present in quantities such that the ratio of hydroxyl equivalents of (1) to (2) is from about 0.05:1 to about 0.2:1;

(C) an organic polyisocyanate in a quantity so as to provide an NCO:OH equivalent ratio of from about 0.85:1 to about 1.2:1; and

(D) a catalytic quantity of a catalyst composition consisting of

(1) from about 20 to about 95 percent by weight of a catalyst represented by the formula

wherein each R_1, R_2, R_3 and R_4 are independently selected from an aliphatic hydrocarbon, aromatic hydrocarbon, substituted aliphatic hydrocarbon, substituted aromatic hydrocarbon groups having from 1 to about 8 carbon atoms; X is the anion portion of an inorganic acid or an acid, ester or acid ester of the element carbon and A is nitrogen or phosphorus; and

(2) from about 5 to about 80 percent by weight of an organometal salt catalyst of the metal tin or lead.

4,118,374
PRODUCTION OF AROMATIC POLYAMIDES FROM DICARBOXYLIC ACID AND DIAMINE

Noboru Yamazaki, and Fukuji Higashi, both of Tokyo, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 609,740, Sep. 2, 1975, Pat. No. 4,045,417. This application May 27, 1977, Ser. No. 801,243
Claims priority, application Japan, Sep. 9, 1974, 49-104247
Int. Cl.[2] C08G *69/28*
U.S. Cl. 528—337 6 Claims

1. In a process for producing a fiber forming aromatic polyamide by polycondensing a dicarboxylic acid of the formula,

$$HOOC - R^2 - COOH \quad (II)$$

wherein R^2 is a straight chain, branched chain or alicylic hydrocarbon radical, an aryl group with or without at least one substituent selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, a phenyl group, a halogen atom, a nitro group and a cyano group, or a radical in which two or more radicals selected from the group consisting of the above-mentioned radicals are bonded through an alkylene group having 1 to 4 carbon atoms, an alkylidene group having 2 to 4 carbon atoms, —CONH— or —SO_2NH—, with an aromatic diamine of the formula,

$$H_2N - R^3 - NH_2 \quad (III)$$

wherein R^3 is an aromatic hydrocarbon radical which may contain one or more substituents on the aromatic nuclei, said substituent being an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, a phenyl group, a halogen atom, a nitro group or a cyano group, and which may contain two or more aromatic hydrocarbon radicals bonded through an alkylene group having 1 to 4 carbon atoms, an alkylidene group having 2 to 4 carbon atoms, —O—, —SO_2—, —S—, —NH—, —NR″— wherein R″ is an alkyl group having 1 to 4 carbon atoms, —CONH—, —CO— or —SO_2NH—, in the presence of a phosphorus compound of the formula,

$$R^4 - P(OR^5)_2 \quad (IV)$$

wherein R^4 is OR^5, a hydroxyl group, an alkyl group having 1 to 6 carbon atoms or an aryl group with or without at least one substituent selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to

6 carbon atoms, a phenyl group, a halogen atom, a nitro group and a cyano group; and R^5 is an aryl group with or without at least one substituent selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, a phenyl group, a halogen atom, a nitro group and a cyano group,

and a teriary amine in the liquid phase, wherein the tertiary amine is used in an amount of 1 mole or more per mole of the phosphorus compound and the phosphorus compound is used in an amount of 2 moles or more per mole of the dicarboxylic acid or diamine,

the improvement which comprises carrying out the polycondensation using a solvent selected from the group consisting of N-methylpyrrolidone and dimethylacetamide as the reaction medium and a metal halide selected from the group consisting of a lithium halide and a calcium halide wherein the metal halide is used in an amount of 1 to 15% by weight based on the weight of the mixture of the tertiary amine and the solvent.

3. A process according to claim 1, wherein the aromatic diamine is p-phenylenediamine, m-xylylenediamine, p-xylylenediamine, bis-(4-aminophenyl)-methane, di-(4-aminophenyl) ether or 2,2-bis-[4-(4-aminophenoxy)phenyl]-propane.

4,118,375
CROSSLINKABLE POLYACRYLONITRILE COPOLYMERS

Christian Lindner, Cologne; Carlhans Suling, Odenthal; Gunter Arend, Dormagen; Dieter Brokmeier, Dormagen, and Gunther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 8, 1977, Ser. No. 804,857

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1976, 2626172

Int. Cl.[2] C08G *2/00, 4/00*

U.S. Cl. 526—240 **6 Claims**

1. An addition copolymer, comprising (1) at least 40% by weight of acrylonitrile; (2) from 0.5 to 40% by weight of at least one acetoacetate of a monoacrylate or a monomethacrylate of an aliphatic diol containing from 2 to 8 carbon atoms; and (3) 0–10% by weight of a acrylic acid or a methacrylic acid alkyl ester; 0–3% by weight of methallyl sulfonic acid, vinyl sulfonic acid, styrene sulfonic acid, or their alkali metal salts; or 0% or 10–30% by weight of vinyl chloride or vinylidene chloride.

4,118,376
HYDROCURABLE OXAZOLIDINE ISOCYANATE PREPOLYMER COMPOSITIONS

Josef Pedain; Wolfgang Wellner, both of Cologne; Hermann Gruber, and Manfred Dietrich, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 18, 1977, Ser. No. 817,083

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632513

Int. Cl.[2] C08G *18/00*

U.S. Cl. 528—59 **10 Claims**

1. Mixture capable of being hardened by water, containing an oxazolidine component and a polyisocyanate component, characterized in that the mixture contains, as polyisocyanate component, an isocyanate prepolymer which has free isocyanate groups and is the reaction product of excess quantities organic polyisocyanates with dispersions of polymerization, polycondensation or polyaddition products in organic polyhydroxyl compounds.

4,118,377
POLYMERIZING BIS-MALEIMIDES

Gaetano F. D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

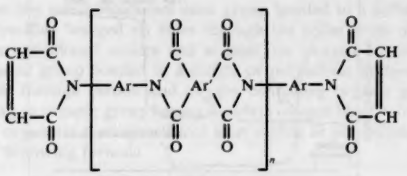
Continuation-in-part of Ser. No. 363,799, May 25, 1973, Pat. No. 3,890,272. This application Aug. 14, 1974, Ser. No. 497,490

Disclosure was published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.[2] C08G *73/12*

U.S. Cl. 526—236 **15 Claims**

1. A process of increasing the molecular weight of a bis-maleimide of the formula:



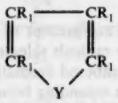
wherein

Ar is a divalent aromatic organic radical,

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms and in the Ar′ radical, and

n is 0 or a positive integer of 1 to 20,

comprising: reacting at a temperature in the range of about 5°–100° C. one mole of the bis-maleimide with from 1 to 2 moles of a cyclic diene of the formula:



wherein

Y is —O—, —S—, or

and

each R_1 is hydrogen or an aliphatic hydrocarbon of 1 to 4 carbon atoms with the proviso that the sum of the R_1's is no greater than 4 carbon atoms,

and thereafter thermally eliminating substantially all the cyclic diene at a temperature in the range of about 30°–120° C. to extend the bis-maleimide in molecular weight to at least a dimer of the bis-maleimide.

4,118,378
NON-BLOOMING ACCELERATOR AND PROCESS FOR VULCANIZATION OF EPDM ELASTOMERS

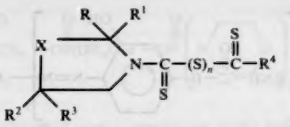
Ivan Christoff Popoff, Ambler; Everett A. Mailey, Norristown, and Paul Gordon Haines, Lafayette Hill, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 695,274, Jun. 11, 1976. This application Sep. 30, 1977, Ser. No. 838,183

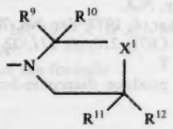
Int. Cl.[2] C08F *28/00, 28/02*

U.S. Cl. 526—36 **25 Claims**

1. In a method of curing ethylene-propylenediene elastomers wherein the elastomer composition has sulfur and/or sulfur donor vulcanization accelerator and other rubber compound ingredients admixed therewith, and said elastomer composition is cured at elevated temperature, the improvement which comprises using as the vulcanization accelerator a compound having the following general structure:



wherein R, R^1, R^2 and R^3 are independently selected from the group consisting of hydrogen, alkyl, and chloroalkyl radicals each having from 1 to 17 carbon atoms, alkenyl radicals having from 2 to 17 carbon atoms, phenyl naphthyl, substituted phenyl and substituted naphthyl radicals each having substituents selected from the group consisting of Cl, —OH, OR^5 and $—NR^5R^6$ wherein R^5 and R^6 are alkyl radicals having 1 to 8 carbon atoms, and n is an integer of from 1 to 4; R^4 is selected from the group consisting of a) $—NR^7R^8$ wherein R^7 and R^8 are independently selected from alkyl radicals having from 1 to 18 carbon atoms and together having a total of at least 5 carbon atoms, b) -NZ wherein N is the ring nitrogen atom of a cyclic amine and Z represents that portion of the cyclic amine ring having at least 5 ring carbon atoms one of which can be replaced by oxygen or sulfur, and c)



wherein R^9, R^{10}, R^{11} and R^{12} are independently selected from the same group from which R is selected and at least one of R^9, R^{10}, R^{11} and R^{12} is other than hydrogen; and X and X^1 are independently selected from oxygen and sulfur atoms.

4,118,379

AMIDATED IMMUNE GLOBULINS AND PROCESS FOR PREPARING THEM

Rudolf Schmidtberger, Marburg-Marbach, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Continuation of Ser. No. 610,458, Sep. 4, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,181

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1974, 2442655

Int. Cl.[2] **A23J** *1/06*

U.S. Cl. 260—112 B **17 Claims**

1. The method of making water-soluble amidated immune globulins which comprises reacting immune globulins with a molar excess of a water-soluble primary monoamine and a water-soluble carbodiimide or a salt thereof in a slightly acidic to neutral aqueous solution.

4,118,380

DECAPEPTIDE ANALOGS OF SOMATOSTATIN

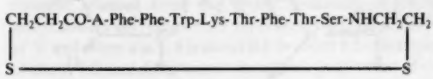
Hans U. Immer, Mount Royal, and Nedumparambil A. Abraham, Dollard des Ormeaux, both of Canada, assignors to Ayerst, McKenna & Harrison Limited, Montreal, Canada

Filed Jul. 25, 1977, Ser. No. 818,500

Int. Cl.[2] **C07C** *103/52*

U.S. Cl. 260—112.5 S **10 Claims**

1. A compound of the formula 1



(1)

in which A is Gly-Asn or a therapeutically acceptable salt thereof.

4,118,381

1:2 COBALT COMPLEX PHENOL-ACETOACETANILIDE BENZENE DISAZO DYESTUFFS

Hermann Fuchs, Kelkheim, Taunus, and Klaus Filzinger, Hofheim, Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

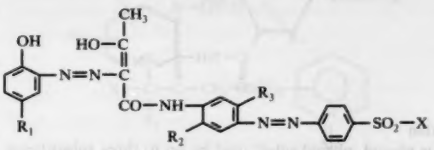
Filed Feb. 2, 1977, Ser. No. 765,003

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1976, 2604220

Int. Cl.[2] **C09B** *45/20*

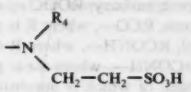
U.S. Cl. 260—148 **1 Claim**

1. A 1:2-cobalt complex disazo dyestuff of a disazo compound of the general formula



(1)

wherein R_1 is hydrogen, halogen, nitro, lower alkyl or lower alkoxy, R_2 is hydrogen, lower alkyl or lower alkoxy, R_3 is hydrogen, lower alkyl or lower alkoxy and X is hydroxy or β-sulfoethyl or a group of the formula



wherein R_4 is hydrogen or lower alkyl.

4,118,382

REACTIVE MONO-AZO DYESTUFFS HAVING A 4-AMINO-3,5(OR-6)-DISULFOACETIC ACID COUPLING COMPONENT AND A REACTIVE GROUP ATTACHED TO THE DIAZO COMPONENT

Horst Jäger, Leverkusen, and Georg Dehmel, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

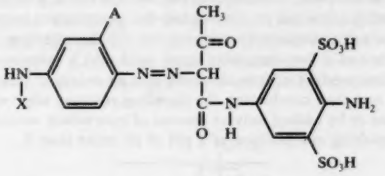
Continuation of Ser. No. 235,856, Mar. 17, 1972, abandoned. This application May 25, 1977, Ser. No. 800,573

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1971, 2113298

Int. Cl.[2] **C09B** *29/36, 62/08, 62/24, 62/40*

U.S. Cl. 260—154 **3 Claims**

1. Reactive dyestuff of the formula



in which

A is hydrogen, carboxy or sulfo; and

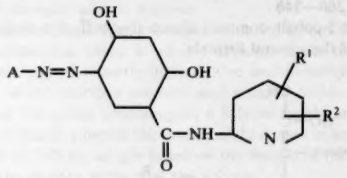
X is a fiber reactive group containing at least one removable substituent bonded to the carbon atom of a —C=N— group in a pyrimidine, sym. triazine or quinoxaline ring and which is capable of forming a covalent bond with amino, amide or hydroxyl groups of natural or synthetic fiber materials under dyeing or printing conditions.

4,118,383
AZO DYES CONTAINING AN N-2-PYRIDINE-2,4-DIHYDROXYBENZAMIDE COUPLER COMPONENT

Raouf Botros, Beech Creek, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Filed Jun. 4, 1976, Ser. No. 692,933
Int. Cl.[2] C09B *29/22, 29/36*
U.S. Cl. 260—156 **11 Claims**

1. An azo compound of the formula:



wherein

A is phenyl, phenyl substituted by up to three substituents, naphthyl or naphthyl substituted by up to two substituents, the substituents being independently selected from the group consisting of alkyl of 1–4 carbon atoms; alkoxy of 1–4 carbon atoms; nitro; cyano; fluoro; chloro; bromo; trifluoromethyl; hydroxy; RCOO—, where R is alkyl of 1–4 carbon atoms; carboxy; ROOC—, where R is alkyl of 1–4 carbon atoms; RCO—, where R is alkyl of 1–4 carbon atoms; benzoyl; RCONH—, where R is alkyl of 1–4 carbon atoms; ArCONH—, where Ar is phenyl; and carbamyl, the nitrogen of which is unsubstituted or singly or doubly substituted with alkyl of 1–4 carbon atoms; and

R^1 and R^2 are independently selected from the group consisting of hydrogen; alkyl of 1–4 carbon atoms; alkoxy of 1–4 carbon atoms; nitro; chloro and bromo.

4,118,384
PROCESS FOR PREPARATION OF AZO DYESTUFFS BY COUPLING IN PRESENCE OF AROMATIC SULPHONIC ACID-FORMALDEHYDE REACTION PRODUCT

Hans-Heinz Mölls; Willy Schiwy, both of Leverkusen; Reinhold Hörnle, Cologne, and Reinhard Nebeling, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 17, 1977, Ser. No. 769,727
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1976, 2607122
Int. Cl.[2] C09B *29/08, 29/26, 29/36, 29/38*
U.S. Cl. 260—163 **5 Claims**

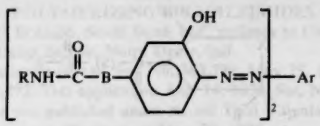
1. In the process of preparing an azo dyestuff by diazotizing an amine and thereafter coupling the diazo component formed with a coupling component, the improvement comprising preparing a low salt or salt free azo dye composition without a step of salt separation by carrying out the diazotization in the presence of a free dispersing agent acid which comprises the reaction product of formaldehyde and an aromatic sulphonic acid, and then conducting the coupling reaction after adding no base or by adding only an amount of base which would give the resulting composition of a pH of no more than 3.

4,118,385
DISAZO COMPOUNDS

Howard A. Harris, New York, N.Y., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 663,426, Mar. 3, 1976, Pat. No. 4,022,700. This application Feb. 14, 1977, Ser. No. 768,123
Int. Cl.[2] C07C *107/04*
U.S. Cl. 260—175 **7 Claims**

1. An azoaryl compound defined by the formula:



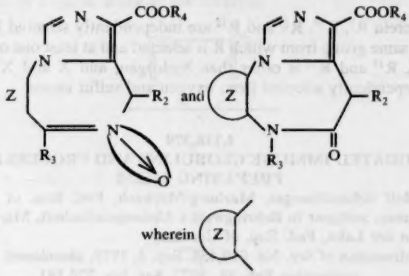
wherein R is an aliphatic hydrocarbyl radical of 16 to 22 carbon atoms, B is —NH— or oxygen, and Ar is an arylene radical selected from the class consisting of phenylene, naphthylene and diphenylene, said arylene radical being either unsubstituted or substituted on each aromatic ring with an aliphatic hydrocarbyl radical of 1 to 4 carbon atoms.

4,118,386
SYNTHESIS OF IMIDAZO[1,5-a]DIAZEPINE-3-CARBOXYLATES

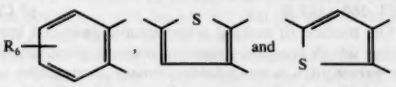
Armin Walser, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 4, 1977, Ser. No. 784,187
Int. Cl.[2] C07D *210/00, 211/02, 487/04*
U.S. Cl. 260—239.3 T **3 Claims**

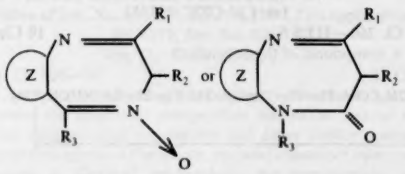
1. A process to produce diazepine-3-carboxylates of the formula



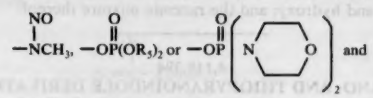
is selected from the group consisting of



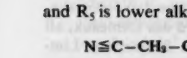
R_6 is selected from the group consisting of hydrogen, halogen, nitro, cyano, trifluormethyl, lower alkyl, and lower alkanoyl; R_4 is lower alkyl; R_3 is selected from the group consisting of phenyl, halo or nitro mono-substituted phenyl, halo or nitro disubstituted phenyl, pyridyl and halo or nitro mono-substituted pyridyl; and R_2 is hydrogen or lower alkyl which comprises a compound of the formula



wherein R_1 is of the formula



and R_5 is lower alkyl with a compound of the formula



in the presence of a base sufficiently strong to generate the anion of the isocyanoacetate.

4,118,387

NAPHTHALIMIDE-4,5-DICARBOXYLIC ACIDS

Otto Fuchs, Frankfurt am Main, and Adolf Kroh, Münster, Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

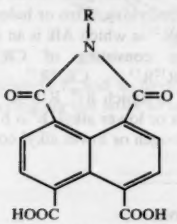
Continuation-in-part of Ser. No. 505,624, Sep. 13, 1974, Pat. No. 4,007,192, which is a division of Ser. No. 398,410, Sep. 18, 1973, abandoned. This application Nov. 5, 1976, Ser. No. 739,277

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1972, 2246111

Int. Cl.² C07D *221/14*

U.S. Cl. 260—281 A **5 Claims**

1. A compound of the formula



or the anhydride thereof, wherein R is alkoxyalkyl having 1 to 6 carbon atoms in each of the alkyl and alkoxy portions.

4,118,388

PROCESS FOR PRODUCING PYRIDINE

Takushi Yokoyama; Hidetaka Kojima; Masaharu Uragami, and Kathuyoshi Miwa, all of Ooi, Japan, assignors to Daicel, Ltd., Sakai, Japan

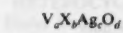
Filed Aug. 10, 1977, Ser. No. 823,477

Claims priority, application Japan, Aug. 11, 1976, 51/96249

Int. Cl.² C07D *213/16*

U.S. Cl. 260—290 R **10 Claims**

1. A process for producing pyridine which comprises oxidatively dealkylating an alkylpyridine, an alkenylpyridine, the alkyl or alkenyl groups of which have one to seven carbon atoms, or a mixture thereof in the gaseous phase with molecular oxygen and steam in the presence of a catalyst comprising active components with a general composition of the formula



wherein *a, c* and *d* respectively represent the atomic proportions of vanadium, silver and oxygen; X respresents at least one element selected from the group consisting of chromium, molybdenum and tungsten; *b* represents the atomic proportion of X; and when *a* is 1, *b* is about 0.1 to about 1.5, *c* is about 0.005 to about 1.0, and *d* represents the atomic proportion of oxygen, is a value determined by the atomic valences of the individual V, X and Ag elements and is about 2.6 to about 7.5; and separating pyridine from the reaction product.

4,118,389

KETOXIME CARBAMATES

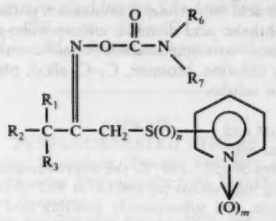
Thomas A. Magee, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 553,648, Feb. 27, 1975, Pat. No. 4,028,413, which is a continuation-in-part of Ser. No. 229,207, Feb. 24, 1972, Pat. No. 3,875,232, which is a continuation-in-part of Ser. No. 132,584, Apr. 8, 1971, abandoned. This application May 31, 1977, Ser. No. 801,585

Int. Cl.² C07D *213/70, 213/89*

U.S. Cl. 260—294.8 R **5 Claims**

1. A composition of matter having the formula:



wherein R_1 is hydrogen or lower alkyl; R_2–R_3 are lower alkyl with the proviso that R_2 and R_3 may be connected to form a cycloalkyl ring of not more than 6 carbon atoms; R_6–R_7 are hydrogen, lower alkyl, or lower alkenyl; *n* is 0, 1 or 2; and *m* is 0 or 1.

4,118,390

1-THIAZOLYL-5-ACYLOXYIMIDAZOLIDINONES

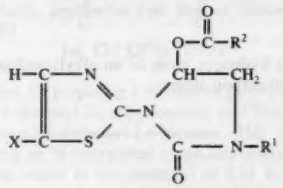
Chin Ching Wu, Libertyville, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Company, Chicago, Ill.

Filed Jun. 1, 1976, Ser. No. 691,949

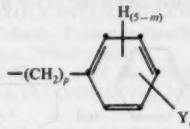
Int. Cl.² C07D *277/28*

U.S. Cl. 260—306.8 R **9 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of chlorine, bromine, fluorine and lower alkylsulfonyl; R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and propargyl; and R^2 is selected from the group consisting of alkyl of up to 18 carbon atoms, lower alkenyl, lower haloalkyl, propargyl, lower alkoxyalkyl, cycloalkyl of from 3 to 7 carbon atoms and



wherein *p* is an integer from 0 to 2; Y is selected from the group consisting of lower alkyl, lower alkenyl, chlorine bromine, fluorine, lower haloalkyl, lower alkoxy, lower alkylthio, nitro and cyano; and *m* is an integer from 0 to 3.

4,118,391
PROCESS FOR THE PREPARATION OF COPPER PHTHALOLCYANINE

Heinz-Ewald Baurecht; Reinhold Hörnle, and Gerd Müller, all of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 16, 1977, Ser. No. 778,154

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1976, 2611546

Int. Cl.[2] C09B *47/04*

U.S. Cl. 260—314.5 **6 Claims**

1. In the process for the preparation of copper phthalocyanine by the baking process from

(a) phthalic acid anhydride, diammonium phthalate, phthalimide, phthalic acid diamide, aminio-imino-isoindolenine or 1-amino-3-oxo-isoindolenine or said compounds substituted by chlorine, bromine, C_1–C_4-alkyl, phenyl, C_1–C_4-alkoxy or sulpho,

(b) urea,

(c) a catalyst and

(d) a copper salt

at temperatures of 150°–350° C. the improvement which comprises reacting ingredients (a) and (b) at 130°–300° C., to form an intermediate, and subsequently reacting said intermediate with ingredient (d); ingredient (c) being added during either of the two above-described reaction steps.

4,118,392
DICARBOXYLIC COMPOUNDS AND POLYESTERS DERIVED THEREFROM

Robert Salle, and Bernard Sillion, both of Grenoble, France, assignors to Institut Francais du Petrole, France

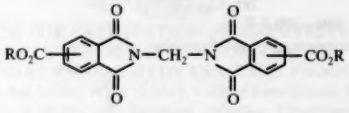
Filed Mar. 9, 1976, Ser. No. 665,170

Claims priority, application France, Mar. 14, 1975, 75 08320; Dec. 24, 1975, 75 39918

Int. Cl.[2] C07D *209/34*

U.S. Cl. 260—326 N **4 Claims**

1. A dicarboxylic compound of the general formula :



where R is a hydrogen atom or an alkyl, cycloalkyl or aryl group of 1–10 carbon atoms.

4,118,393
PHENYL AZABICYCLOHEXANONES

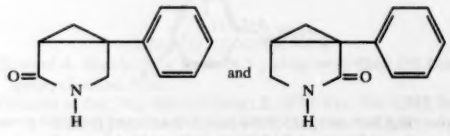
William Joseph Fanshawe, Pearl River, N.Y.; Sidney Robert Safir, River Edge, N.J., and Lantz Stephen Crawley, Spring Valley, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 23, 1977, Ser. No. 809,341

Int. Cl.[2] C07D *209/52, 471/08*

U.S. Cl. 260—326.5 B **12 Claims**

1. An optically active compound of the formulae:



wherein the phenyl moiety is unsubstituted, mono- or di-substituted from the group consisting of halogen, straight chain C_1–C_6 alkyl, C_1–C_6 alkoxy, nitro, amino, trifluoromethyl, acetamido and hydroxy; and the racemic mixture thereof.

4,118,394
PYRANO- AND THIOPYRANOINDOLE DERIVATIVES

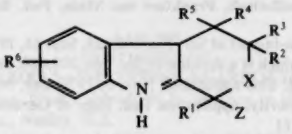
Christopher A. Demerson, St. Laurent; Leslie G. Humber, Dollard des Ormeaux; Andre A. Asselin, Lemoyne; Ivo Jirkovsky, Montreal, and Thomas A. Dobson, Dollard des Ormeaux, all of Canada, assignors to Ayerst, McKenna & Harrison Limited, Montreal, Canada

Division of Ser. No. 733,834, Oct. 18, 1976, Pat. No. 4,056,538, which is a division of Ser. No. 507,085, Sep. 18, 1974, abandoned, which is a division of Ser. No. 217,627, Jan. 13, 1972, Pat. No. 3,852,285. This application Aug. 8, 1977, Ser. No. 822,456

Int. Cl.[2] C07D *491/04, 513/04*

U.S. Cl. 260—326.28 **7 Claims**

1. A compound of the formula



in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; X is oxy or thio; and Z is Alk-NR^8COR^{21} in which Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR_{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}$ $CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ in which R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl, R^8 is hydrogen or lower alkyl and R^{21} is hydrogen or lower alkyl consisting of one to five carbon atoms.

4,118,395
METHOD FOR THE PRODUCTION OF INDOLYL LACTONES

Werner J. Frantsits, Boltzmanngasse 9a-11, Vienna 9, Austria

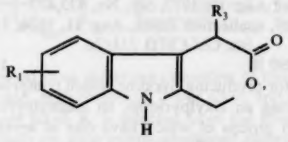
Filed Jun. 20, 1977, Ser. No. 808,272

Claims priority, application Austria, Jun. 28, 1976, 54719/76

Int. Cl.[2] C07D *491/04*

U.S. Cl. 260—326.29 **7 Claims**

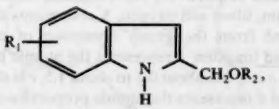
1. A method for the production of indolyl lactones of the formula



(I)

wherein R_1 is a member of the group consisting of hydrogen, halogen and an alkoxy group having 1 to 4 C atoms and R_3 is hydrogen, comprising the steps of

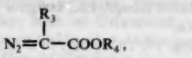
reacting a 2-hydroxymethylindole of the formula



(II)

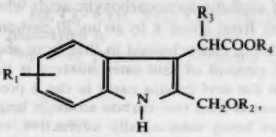
wherein R_1 has the above named meaning and R_2 is a member of the group consiting of an alkanoyl group and a

phenyl alkanoyl group, with an α-diazoester of the formula



(III)

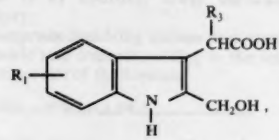
wherein R_3 has the above named meaning and R_4 is an alkyl group having 1 to 4 carbon atoms or a benzyl group, to a 3-indolyl acetic acid ester of the formula



(IV)

wherein R_1, R_2, R_3 and R_4 have the above named meanings,

saponifying the thus obtained 3-indolyl acetic acid ester of the formula (IV) to the 3-indolyl acetic acid of the formula



(V)

wherein R_1 and R_3 have the above named meaning, and dehydrating the latter to indolyl lactone of the formula (I).

4,118,396

PYRROLIDINE DERIVATIVES

Giorgio Pifferi, Milan, and Mario Pinza, Corsico (Milan), both of Italy, assignors to I.S.F. S.p.A., Milan, Italy

Filed Aug. 12, 1976, Ser. No. 713,901

Claims priority, application Italy, Aug. 13, 1975, 26326 A/75

Int. Cl.² C07D *207/28*

U.S. Cl. 260—326.43 **7 Claims**

1. 2-(4-Hydroxypyrrolidin-2-on-1-yl) acetamide.
3. 2-(4-Methoxypyrrolidin-2-on-1-yl) acetamide.
4. 2-(4-Allyloxpyrrolidin-2-on-1-yl) acetamide.

4,118,397

DERIVATIVES OF 5-AMINOBENZOIC ACID HAVING A HETEROCYCLIC SUBSTITUENT IN THE 3-POSITION

Dieter Bormann, Kelkheim; Wulf Merkel, Neuenhain, and Roman Muschaweck, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

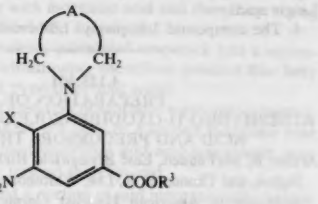
Division of Ser. No. 570,649, Apr. 23, 1975, Pat. No. 4,010,273. This application Dec. 6, 1976, Ser. No. 747,479

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1974, 2419970

Int. Cl.² C07D *207/04, 207/18*

U.S. Cl. 260—326.41 **2 Claims**

1. A compound of the formula



wherein

R^3 is hydrogen or alkyl having 1 to 4 carbon atoms,

A is $—CH_2—CH_2—$ or $—CH=CH—$,

X is $—OR^4$, $—SR^4$, $—NHR^4$, or benzyl; and

R^4 is phenyl.

4,118,398

PERFLUORINATED ETHERS

Thomas Martini, Neuenhain, Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 704,689, Jul. 12, 1976, Pat. No. 4,052,277. This application Apr. 28, 1977, Ser. No. 791,997

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1975, 2531511

Int. Cl.² C07D *319/10*

U.S. Cl. 260—340.6 **2 Claims**

1. The compound perfluoro-2,3-bis-(3′,6′-dimethyl-1′,4′-dioxane-2′-yloxy)-butane.
2. The compound perfluoro-2,9-bis-(3′,6′-dimethyl-1′,4′-dioxane-2-yl-oxy)-5,6-dimethyl-4,7-dioxadecane.

4,118,399

PROCESS FOR PREPARING PERFLUORO-α-(3,6-DIMETHYL-1,4-DIOXANYL-2-OXY)-PROPIONIC ACID FLUORIDE

Thomas Martini, Bad Soden am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 19, 1977, Ser. No. 798,311

Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623090

Int. Cl.² C07D *319/12*

U.S. Cl. 260—340.2 **2 Claims**

1. A process for preparing a mixture of perfluoroalpha-(3,6-di-methyl-1,4-dioxanyl-2-oxy)-propionic acid fluoride (II) and perfluoro-2-oxo-3,6-dimethyl-1,4-dioxane (III) which comprises reacting an N-formylated secondary amine with hexafluoropropene oxide in the presence of 0.01 to 0.5 mols of trisdimethyl amino difluorophosphorane (IV) per mole of amine as a catalyst at a temperature of −40° to +5° C. and using an HFPO/amine ratio of at least 2.5:1 to produce a mixture containing a relatively high proportion of compound (II).

4,118,400

PROCESS FOR PREPARING 2,3-DIHYDRO-7-BENZOFURANOLS AND BENZODIOXOLE INTERMEDIATE THEREFOR

William James Michaely, Princeton Junction, N.J., assignor to FMC Corporation, Philadephia, Pa.

Filed Sep. 22, 1977, Ser. No. 835,630

Int. Cl.² C07D *317/46, 307/86*

U.S. Cl. 260—340.5 **4 Claims**

1. A process for preparing 2,3-dihydro-2,2-dimethyl-7-benzofuranol which comprises thermally rearranging 2-isopropyl-1,3-benzodioxole at a temperature above about 135° C. in the presence of a catalytic amount of a catalyst selected from the group consisting of (1) an acid clay having an acid value of 1

mg to 16 mg potassium hydroxide per gram of clay and (2) a Lewis acid.

4. The compound 2-isopropyl-1,3-benzodioxole.

4,118,401

PREPARATION OF 6,11-DIHYDRO-11-OXODIBENZ[B,E]OXEPIN-2-ACETIC ACID AND PRECURSORS THEREFOR

Arthur R. McFadden, East Brunswick; Richard C. Allen, Flemington, and Thomas B. K. Lee, Whitehouse Station, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Oct. 19, 1977, Ser. No. 843,482
Int. Cl.[2] C07D *313/12*
U.S. Cl. 260—333 **1 Claim**

1. A method of preparing 6,11-dihydro-11-oxodibenz[b,e]oxepin-2-acetic acid which comprises reacting 5-acetylsalicylic acid with sulfur and morpholine according to the conditions of the Willgerodt Reaction to yield 3-carboxy-4-hydroxyphenylthioacetmorpholide; reacting said 3-carboxy-4-hydroxyphenylthioacetmorpholide with a benzylhalide in the presence of a mild base under reflux conditions to form 4-benzyloxy-3-(benzyloxycarbonyl)phenylacetmorpholide; refuxing said 4-benzyloxy-3-(benzyloxycarbonyl)phenylacetmorpholide with aqueous potassium hydroxide to form 4-benzyloxy-3-carboxyphenylacetic acid; and cyclizing said 4-benzyloxy-3-carboxyphenylacetic acid.

4,118,402

PREPARATION OF MALEIC ANHYDRIDE

Hideo Suzuki; Takahisa Sato; Tatsuo Kubota; Shigemi Osaka, and Shigeru Komatsu, all of Himeji, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Japan

Division of Ser. No. 636,756, Dec. 1, 1975, Pat. No. 4,036,780. This application Apr. 28, 1977, Ser. No. 791,947
Claims priority, application Japan, Dec. 2, 1974, 49-136995
Int. Cl.[2] C07D *307/60*
U.S. Cl. 260—346.75 **7 Claims**

1. A process for the preparation of maleic anhydride comprising catalytically oxidizing benzene at a temperature of 330° to 450° C with a molecular oxygen containing gas in the presence of a catalyst comprising a porous inert support of an alkali metal content, calculated as oxide, of at most 0.3% by weight, an apparent porosity of 20 to 70%, BET surface area of 0.01 to 1 m^2/g and the total volume of pores of diameters of at least one micron amounts to at least 80% of the total volume of pores of diameters not exceeding 100 microns, and supported thereon a catalytically active substance of constituent composition comprising (a) 1 mole of vanadium pentoxide, (b) 0.3 to 1.2 moles of molybdenum trioxide, (c) 0.005 to 0.05 moles of phosphorus pentoxide, (d) 0.03 to 0.2 moles of sodium oxide and (e) 0 to 0.05 moles of potassium oxide.

4,118,403

RECOVERY OF MALEIC ANHYDRIDE

James E. White, Coshocton, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 18, 1976, Ser. No. 742,936
Int. Cl.[2] C07D *307/60*
U.S. Cl. 260—346.76 **8 Claims**

1. In a process for the recovery of maleic anhydride from a gaseous reaction mixture wherein the gaseous reaction mixture containing the maleic anhydride is contacted with a solvent to remove the maleic anhydride from the gaseous reaction mixture, and the solvent is stripped of the maleic anhydride at a temperature between about 200° C. and about 250° C. at a pressure less than 760 torr, the temperature being below the thermal decomposition point of the solvent at the existing pressure, the improvement which comprises contacting the gaseous reaction mixture with a solvent comprising a dialkyl phthalate having 2 to 8 carbon atoms in each alkyl chain and from about 0.5 to about 10 weight percent phthalic anhydride.

4,118,404

PROCESS FOR PREPARING ALKANOL AMIDE COMPOSITIONS

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 17, 1973, Ser. No. 397,672
Int. Cl.[2] C07C *103/38*
U.S. Cl. 260—404 **29 Claims**

1. A process for producing alkanol amide mixtures which comprises:

reacting a di lower alkanol amide with a mixture of lower alkyl esters of aliphatic monocarboxylic acids whose acyl groups contain from about 8 to about 20 carbon atoms, said mixture being characterized in that from about 2 to about 20 mol percent of said ester mixture is branched ester in which the acyl groups carry in the α position an alkyl substituent at least two carbon atoms in length, said branched ester being substantially unreactive with said amine, the amount of said amine employed being sufficient to convert at least 10 mol percent of the ester mixture into di lower alkanol amide; and then

reacting the product from the preceding reaction with a mono lower alkanol amine to convert unreacted ester into mono lower alkanol amide, both said reactions being carried out in the presence of a base catalyst.

4,118,405

METHOD OF PRODUCING AN ACYLATED DERIVATIVE OF AN EPOXY FATTY ACID ESTER OR EPOXY NATURAL OIL

Leonard Edward Hodakowski, Saint Albans, and Lawrence George Hess, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,465
Int. Cl.[2] C09F *5/00*; C11C *3/00*
U.S. Cl. 260—405 **14 Claims**

1. In a method of producing an acylated derivative of an epoxy fatty acid ester or epoxy natural oil having aliphatic chains of 10 to 24 carbon atoms and including at least one oxirane segment per molecule, by reacting said epoxy fatty acid ester or epoxy natural oil with a vinyl aliphatic monocarboxylic acid in contact with 0.10 to 5.0 parts of an acylation catalyst, per 100 parts of reaction mixture, a polymerization inhibitor and gaseous oxygen, the improvement which comprises:

(A) the addition of said monocarboxylic acid to a reaction mixture comprising the epoxy fatty acid ester or epoxy natural oil, acylation catalyst, polymerization inhibitor and gaseous oxygen; or

(B) the addition of said acylation catalyst to a reaction mixture comprising the epoxy fatty acid ester or epoxy natural oil, said monocarboxylic acid, polymerization inhibitor and gaseous oxygen; or

(C) the addition of a mixture of said monocarboxylic acid and said acylation catalyst to a reaction mixture comprising the epoxy fatty acid ester or epoxy natural oil, polymerization inhibitor and gaseous oxygen,

said addition being made at a temperature of from about 100° C. to about 125° C., and maintaining the reaction temperature from about 105° C. to about 130° C. for a period of time sufficient to complete the acylation reaction.

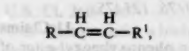
4,118,406

PROCESS FOR PREPARING CIS-OLEFINS

Hans Jürgen Bestmann, Erlangen; Werner Theo Stransky, and Otto Vostrowsky, both of Uttenreuth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 671,417, Mar. 29, 1976, Pat. No. 4,057,593, which is a continuation of Ser. No. 521,170, Nov. 5, 1974, abandoned. This application Aug. 8, 1977, Ser. No. 823,102
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1973, 2355534
Int. Cl.[2] C11C *3/02;* C07C *29/00, 1/00*
U.S. Cl. 260—410.9 R 14 Claims

1. An improved process for preparing a cis-olefin of the formula



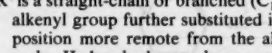
III

wherein

R is straight-chain or branched (C_1–C_{15}) alkyl or (C_2–C_{15}) alkenyl and

R^1 is a straight-chain or branched (C_1–C_{20}) alkyl or (C_2–C_{20}) alkenyl group further substituted in the 3-position or in a position more remote from the aldehyde group in Formula II by hydroxy, lower carbalkoxy or (C_1–C_3) acyloxy,

which comprises dissolving sodium or potassium in a hexaalkylphosphoric acid triamide, adding to the solution obtained a phosphonium salt of the formula



I

adding to the reaction mixture obtained an aldehyde of the formula

II

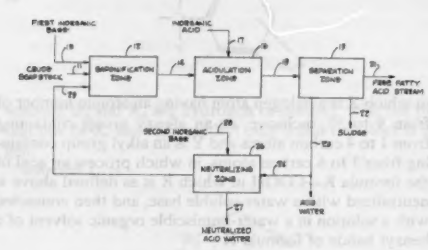
and isolating the product obtained.

4,118,407

FATTY ACID RECOVERY FROM SOAPSTOCK

Jerry F. P. Red, Cleveland, Ohio, and Juan B. Ilagan, Jr., Fullerton, Calif., assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 757,380, Jan. 6, 1977, abandoned. This application Jun. 27, 1977, Ser. No. 810,518
Int. Cl.[2] C11B *13/00;* C11C *1/04*
U.S. Cl. 260—412.5 10 Claims



1. A process for recovering free fatty acid from aqueous crude soapstock containing saponifiable fatty material comprising a glyceride oil; which comprises:

(a) admitting said soapstock, a first inorganic base, and a recycle of inorganic salt-containing neutralized acid water from a later step of the process into a saponification zone held at a temperature of between about 80° and about 95° C.;

(b) passing the resulting saponified soapstock into an acidulation zone along with inorganic acid and therein springing free fatty acid from said soapstock;

(c) passing the resulting acidulated soapstock into a separation zone and withdrawing therefrom product free fatty acid stream and byproduct acid water;

(d) passing at least a portion of said acid water into a neutralizing zone along with a flow of a second inorganic base sufficient to at least neutralize said acid water with inorganic salt being formed thereby; and

(e) recycling at least a portion of said inorganic salt-containing neutralized acid water to said saponification step of the process, the proportion of inorganic base fed to the saponification zone being sufficient to virtually completely saponify said saponifiable fatty material in said soapstock admitted to the process.

4,118,408

ORGANOPHOSPHORUS NICKEL COMPLEXES AND PREPARATION THEREOF

Darryl R. Fahey, and John E. Mahan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 7, 1976, Ser. No. 684,350
Int. Cl.[2] C07F *15/04*
U.S. Cl. 260—439 R 9 Claims

1. Bis(μ-diphenylphosphido)tris(triethylphosphine)dinickel.

2. A process of preparing bis(μ-diphenylphosphido)tris(triethylphosphine)dinickel, a dinickel complex comprising placing tris(triethylphosphine)(triphenylphosphine)nickel(O) in a suitable diluent to form a mixture under an inert atmosphere at a pressure such that the diluent is maintained essentially in the liquid phase while said mixture is maintained at a temperature sufficient to yield said dinickel complex.

4,118,409

PROCESS FOR THE SIMULTANEOUS PRODUCTION OF TRIMETHYLALUMINUM AND ALKYLALUMINUM HALIDES

Scott H. Eidt, Seabrook; Spencer C. Watson, and George Charles Heilig, both of La Porte, all of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Mar. 27, 1974, Ser. No. 455,448
Int. Cl.[2] C07F *5/06*
U.S. Cl. 260—448 A 13 Claims

1. A Redistribution Process for the production of trimethylaluminum and alkylaluminum bromides or iodides comprising forming a mixture of methylaluminum halides selected from the group consisting of dimethylaluminum bromide, dimethylaluminum iodide, methylaluminum dibromide, methylaluminum diiodide, methylaluminum sesquibromide, methylaluminum sesquiiodide, a mixture of dimethylaluminum bromide, methylaluminum dibromide and methylaluminum sesquibromide and a mixture of dimethylaluminum iodide, methylaluminum diiodide and methylaluminum sesquiiodide and an aluminum trialkyl wherein the alkyl radicals contain from 2 to about 16 carbon atoms and distilling said mixture in an efficient distillation column to effect separation of said mixture into a first fraction consisting essentially of trimethylaluminum and a residue of alkylaluminum bromides or iodides.

4,118,410

POLYPHENYL-POLYMETHYLENE-POLYISOCYANATE MIXTURES

Franz Lutz Friedel, Oppenwehe; Armin Schone, Heede, and Franz Gottfried Reuter, Lemfoerde, all of Germany, assignors to Gottfried Reuter GmbH i.L., Lemforde, Germany

Continuation of Ser. No. 221,030, Jan. 26, 1972, abandoned. This application Nov. 1, 1976, Ser. No. 737,693

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1971, 2105193

Int. Cl.[2] C07C *119/048*

U.S. Cl. 260—453 AM **2 Claims**

1. Organic higher functional polyisocyanates obtained by a process of separating a mixture which contains isomers of diphenylmethane diisocyanate and higher functional polyisocyanates having more than two benzene rings, said process comprising distilling said mixture under vacuum at a pressure of between 10^{-3} and 10^{-1} mm/Hg. under conditions which avoid chemical change in the organic polyisocyanates contained in the mixture and thereby separating the polyisocyanates into two fractions with a desired first fraction containing said higher functional polyisocyanates with only a trace of said isomers and having a viscosity of 15,000 to 130,000 cp/25° C., and a second fraction consisting essentially of said isomers.

4,118,411

LOW-TEMPERATURE STORAGE STABLE LIQUID DIPHENYLMETHANE DIISOCYANATES

Helmut F. Reiff, and Richard S. Pantone, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Feb. 9, 1977, Ser. No. 766,997

Int. Cl.[2] C07C *119/048*

U.S. Cl. 260—453 SP **22 Claims**

1. A diisocyanate compound which is both stable and liquid at −5° C. for at least 48 hours, comprising the reaction product of:

(a) a diphenylmethane diisocyanate containing from about 15 to about 70 percent by weight of the 2,4'-isomer, and

(b) a material selected from the group consisting of propylene glycol and poly-1,2-propylene ether glycols.

4,118,412

PREPARATION CYANO SUBSTITUTED CYCLOPROPANE

Peter John Vernon Cleare, Ascot; Albert Edward Kaye, Greater Manchester, and David John Milner, Runcorn, all of England, assignors to Imperial Chemical Industries Limited, London, England

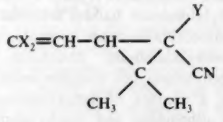
Filed Jul. 7, 1977, Ser. No. 813,669

Claims priority, application United Kingdom, Jul. 7, 1976, 28240/76

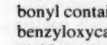
Int. Cl.[2] C07C *121/48*

U.S. Cl. 260—464 **18 Claims**

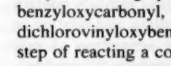
1. A process for the preparation of a compound of formula:



wherein X is chlorine or bromine and Y is cyano, alkoxycarbonyl containing up to four carbon atoms in the alkoxy moiety, benzyloxycarbonyl, phenoxybenzyloxycarbonyl or 2,2-dichlorovinyloxybenzyloxycarbonyl, which comprises the step of reacting a compound of formula:



with a diene of formula:



in the presence of at least one reducible copper salt.

4,118,413

PREPARATION OF PHENOXYBENZYL ESTERS

Derek A. Wood, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

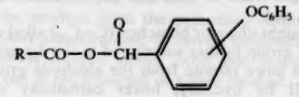
Division of Ser. No. 737,312, Nov. 1, 1976, Pat. No. 4,061,664. This application Aug. 15, 1977, Ser. No. 824,459

Claims priority, application United Kingdom, Nov. 12, 1975, 46700/75

Int. Cl.[2] C07C *69/74, 69/76, 121/75*

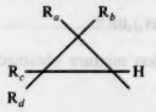
U.S. Cl. 260—465 D **11 Claims**

1. A process for the preparation of a phenoxybenzyl ester of formula (I)



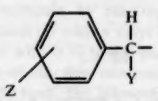
wherein Q is a hydrogen atom or a cyano group and R is

a. a cyclopropyl group of the formula

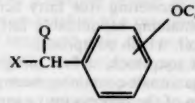


in which R_a and R_b each is an alkyl group containing from 1 to 6 carbon atoms, or a halogen atom having an atomic number of from 9 to 35, inclusive, or when R_a is a hydrogen atom then R_b is an alkenyl group containing from 2 to 6 carbon atoms optionally substituted by from 1 to 3 chlorine or bromine atoms, R_c and R_d each is an alkyl group containing from 1 to 6 carbon atoms, or when R_c is hydrogen then R_d is an alkenyl group having from 2 to 6 carbon atoms optionally substituted by from 1 to 3 chlorine or bromine atoms or either of R_a and R_b or R_c and R_d when taken together is an alkylene group containing from 2 to 6 carbon atoms; or

b. a benzyl group of the fromula



in which Z is a halogen atom having an atomic number of from 9 to 35, inclusive, or an alkoxy group containing from 1 to 4 carbon atoms and Y is an alkyl group containing from 1 to 6 carbon atoms, in which process an acid of the formula R—COOH in which R is as defined above is neutralized with a water-soluble base, and then contacted with a solution in a water-immiscible organic solvent of a benzyl halide of formula II



in which X is a halogen atom; and Q is as defined above in the presence of a phase-transfer catalyst comprising a

tetrahydrocarbyl ammonium or phosphonium halide in which the hydrocarbyl groups are selected from aromatic, aliphatic, cycloaliphatic or unsaturated groups, said groups together containing a total number of carbon atoms of from 12 to 70.

4,118,414
DIFLUORAMINO COMPOUNDS AND PERFLUOROGUANIDINE-PENTAERYTHRITYL NITRATES

Melvin Goldstein, Cranford, and William E. Tyler, III, New Providence, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Mar. 28, 1966, Ser. No. 540,140
Int. Cl.[2] C07C *77/02*
U.S. Cl. 260—467 **5 Claims**

1. Compounds which are perfluoroguanidine adducts of pentaerythrityl nitrates having residual hydroxyl groups.

2. The compound tris(difluoramino)methoxy pentaerythrityl trinitrate, having the formula:

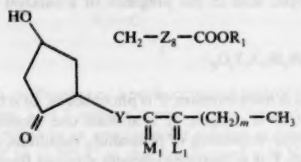
$(NF_2)_3COCH_2C(CH_2ONO_2)_3$.

4,118,415
INTER-OXA-13,14-DIHYDRO-9β-PGD$_1$ COMPOUNDS

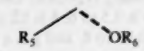
Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,242, Sep. 17, 1975, Pat. No. 4,016,184. This application Dec. 30, 1976, Ser. No. 756,105
Int. Cl.[2] C07C *177/00*
U.S. Cl. 562—503 **33 Claims**

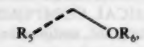
1. A prostaglandin analog of the formula



wherein Y is cis—CH=CH— or trans—CH=CH—; wherein m is one to 5, inclusive; wherein M_1 is

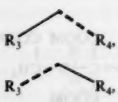


or

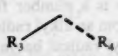


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

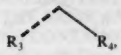
wherein L_1 is



or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and

wherein Z_8 is

(1) $—CH_2—O—CH_2—(CH_2)_g—CH_2—$,
(2) $—(CH_2)_2—O—(CH_2)_g—CH_2—$, or
(3) $—(CH_2)_3—O—(CH_2)_g—$,

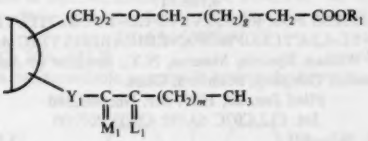
wherein g is one, 2, or 3.

4,118,416
5-OXA-13,14-DIDEHYDRO-PGF$_1$ COMPOUNDS

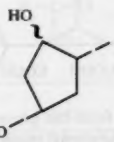
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,739, Feb. 13, 1976, Pat. No. 4,029,681. This application Mar. 7, 1977, Ser. No. 776,554
Int. Cl.[2] C07C *177/00*
U.S. Cl. 562—503 **53 Claims**

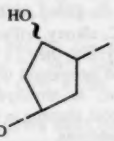
1. A prostaglandin analog of the formula:



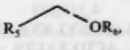
wherein D is



or



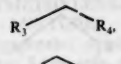
wherein Y_1 is —C≡C—;
wherein *g* is 1, 2, or 3;
wherein *m* is 1 to 5, inclusive;
wherein M_1 is



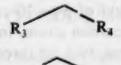
or

wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is



or a mixture of



and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

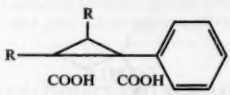
4,118,417

PROCESS FOR RESOLVING CIS-1-SUBSTITUTED PHENYL-1,2-CYCLOPROPANEDICARBOXYLIC ACIDS

Joseph William Epstein, Monroe, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 23, 1977, Ser. No. 809,340
Int. Cl.² C07C *63/00*; C07D *207/00*
U.S. Cl. 562—401 **3 Claims**

1. A method for resolving a compound of the formula:



wherein R is selected from the group consisting of hydrogen and C_1–C_6 alkyl; and the phenyl moiety is unsubstituted, mono- or di-substituted from the group consisting of hydrogen, halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, nitro, amino, acetamido and hydroxy; into their (+) and (−) isomers which comprises reacting said compound with either (+) or (−)-α-(1-naphthyl)-ethylamine, in tetrahydrofuran, to produce a solid; collecting said solid, slurring in water, basifying, extracting with ether, and acidifying.

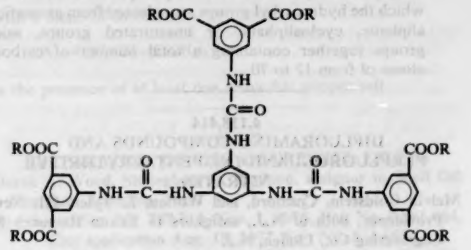
4,118,418

5-PHENENYLTRIS (UREYLENE) TRIISOPHTHALIC ACID SALTS

Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 29, 1977, Ser. No. 811,099
Int. Cl.² C07C *63/32, 69/76*
U.S. Cl. 562—439 **2 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of alkali metal; and the pharmaceutically acceptable salts thereof.

4,118,419

CATALYTIC PROCESS FOR THE PREPARATION OF AN UNSATURATED CARBOXYLIC ACID

Kazuhiro Ishii; Hideo Matsuzawa; Masao Kobayashi, and Hiromichi Ishii, all of Otake, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Nov. 26, 1976, Ser. No. 745,406
Claims priority, application Japan, Dec. 3, 1975, 50-144133; Dec. 12, 1975, 50-148860; Apr. 6, 1976, 51-38517
Int. Cl.² C07C *51/32*
U.S. Cl. 562—534 **7 Claims**

1. A process for the preparation of an unsaturated carboxylic acid, which comprises:

catalytically oxidizing acrolein, methacrolein or mixtures thereof in the gas phase at a temperature of 240° to 450° C with molecular oxygen to the corresponding unsaturated carboxylic acid in the presence of a catalyst of the formula:

$$P_aMo_bBi_cSb_dX_eY_fO_g$$

wherein Mo is molybdenum, P is phosphorus, Bi is bismuth, Sb is antimony, O is oxygen, X is at least one element selected from the group consisting of potassium, rubidium, cesium and thallium, and Y is at least one element selected from the group consisting of cobalt, zinc, niobium, chromium, nickel, iron, silicon, tantalum, cadmium, uranium, manganese, copper, thorium, selenium, aluminum, titanium, tungsten and cerium, and wherein *a, b, c, d, e, f,* and *g* represent the atomic ratio of each component such that *a* is 0.5 to 6; *b* is 12; *c* is 0.01 to 6; *d* is 0.01 to 12; *e* is 0.2 to 6; *f* is 0.01 to 6, and *g* is a value determined by the valencies of the elements present in the catalyst.

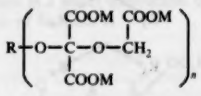
4,118,420

CHEMICAL COMPOUNDS

Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 471,088, May 17, 1974, abandoned. This application Mar. 25, 1976, Ser. No. 670,336
Int. Cl.² C07C *59/12*
U.S. Cl. 562—583 **10 Claims**

1. A compound corresponding to the following formula



wherein M is alkali metal or ammonium and acids and esters thereof, and wherein *n* is a number from 1 through 3, and wherein R is selected from an alkyl radical having from 1 to 20 carbon atoms, an alkenyl radical having from 1 to 20 carbon atoms, an alkynyl radical having from 1 to 20 carbon atoms, an

alkanol radical having from 2 to 20 carbon atoms, and an ether radical having at least 3 carbon atoms.

4,118,421

PROCESS FOR THE MANUFACTURE OF PERFLUORO-ALKOXY-PROPIONIC ACID FLUORIDES

Thomas Martini, Bad Soden am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

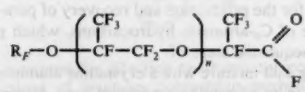
Filed Jun. 21, 1977, Ser. No. 808,537

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1976, 2627986

Int. Cl.² C07C *51/58*

U.S. Cl. 260—544 F **6 Claims**

1. A process for the manufacture of perfluoro-alkoxy-propionic acid fluorides of the formula



(I)

wherein R_F is a perfluoro-alkyl radical having from 1 to 8 carbon atoms, and n is 0, 1 or 2, by catalytic addition of hexafluoropropene epoxide to perfluorocarboxylic acid fluorides of the formula

(II)

wherein R_F, is fluorine or a perfluorinated hydrocarbon radical having from 1 to 7 carbon atoms, which comprises carrying out the addition in an aprotic polar solvent at temperatures of from $-50°$ to $+20°$ C in the presence of a N,N,N′,N′-tetra-alkyl-substituted diaminodifluoromethane as catalyst.

4,118,422

POLYOLS FROM 2,3-MORPHOLINEDIONES

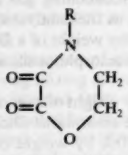
Howard P. Klein, Houston, Tex., assignor to Texaco Development Corp., Houston, Tex.

Continuation-in-part of Ser. No. 716,610, Aug. 23, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 830,724

Int. Cl.² C07C *29/00, 103/127, 103/38;* C08G *71/04*

U.S. Cl. 260—561 A **9 Claims**

1. A polyol comprising the reaction product of a 2,3-morpholinedione and a polyoxypropylene polyamine, said morpholinedione reactant having the following structural formula:



where R is selected from the group consisting of alkyl, cyanoalkyl, alkanol, phenyl and substituted phenyl.

4,118,423

AMINATED γ-DIALDEHYDE; METHODS FOR PREPARING THE SAME AND COSMETIC COMPOSITIONS CONTAINING THE SAME

Guy Vanlerberghe, Montjay-la-Tour par Claye-Souilly, and Georges Rosenbaum, Asnieres, both of France, assignors to L'Oreal, Paris, France

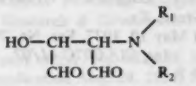
Division of Ser. No. 463,808, Apr. 24, 1974, Pat. No. 4,014,990, which is a division of Ser. No. 210,217, Dec. 20, 1971, Pat. No. 3,812,246. This application Dec. 14, 1976, Ser. No. 750,518

Claims priority, application Luxembourg, Dec. 24, 1970, 62317

Int. Cl.² C07C *95/02, 95/06, 95/08*

U.S. Cl. 260—584 A **3 Claims**

1. Aminated γ-dialdehyde having the formula



wherein R_1 and R_2 each independently are selected from the group consisting of hydrogen, alkyl having 1–6 carbon atoms, hydroxyalkyl wherein the alkyl moiety has 1–6 carbon atoms and cycloalkyl having 3–6 carbon atoms.

4,118,424

BIODEGRADABLE INSECTICIDES

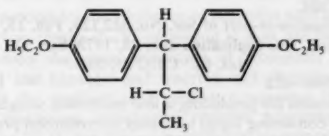
Robert L. Metcalf, and Joel R. Coats, both of Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Division of Ser. No. 520,370, Nov. 4, 1974, Pat. No. 4,003,950. This application Jun. 9, 1976, Ser. No. 694,458

Int. Cl.² C07C *43/20*

U.S. Cl. 260—613 R **2 Claims**

1. A biodegradable insecticide having the formula,



4,118,425

METHOD FOR PREPARATION OF ETHERS

Sheldon Herbstman, Spring Valley, N.Y., assignor to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 584,323, Jun. 6, 1975, abandoned. This application Apr. 29, 1977, Ser. No. 792,285

Int. Cl.² C07C *41/06, 41/10*

U.S. Cl. 260—614 A **9 Claims**

1. The method of preparing ether from an alkane hydrocarbon charge containing normal butane which comprises

a. isomerizing said alkane hydrocarbon charge at isomerizing conditions including temperature of 300° F.–400° F. and pressure of 100–1000 psig in the presence of an isomerization catalyst and in the presence of 0.1–5 moles of added hydrogen per mole of hydrocarbon charge, wherein the space velocity (LHSV) of the total charge is 0.5–8;

b. withdrawing from said isomerization an isomate containing isobutane and n-butane in weight ratio of 1.0–2.0:1;

c. dehydrogenating said isomate at 900° F.–1100° F. and 0–1000 psig thereby forming a dehydrogenate containing isobutene and n-butane in weight ratio of 1–3:1;

d. reacting said dehydrogenate with at least one water-soluble aliphatic C_1 to C_6 alcohol in the presence of etherification catalyst at etherification reaction conditions including temperature of 100° F.–300° F. and 50–750 psig thereby

forming reaction mixture containing product ether, water-soluble alcohol, and n-butane;

e. contacting said reaction mixture with water thereby forming (i) aqueous extract containing water-soluble alcohol and (ii) raffinate containing said normal butane and said product ether substantially free of said water-soluble alcohol;

f. recovering said raffinate from said contacting operation; and

g. recovering said product ether from said raffinate.

4,118,426

PRODUCTION OF HYDROXY ETHERS

Norman L. Holy, Bowling Green, Ky., and Theodore E. Nalesnik, Yonkers, N.Y., assignors to Western Kentucky University, Bowling Green, Ky.

Filed May 10, 1977, Ser. No. 795,602

Int. Cl.[2] C07C *41/02*

U.S. Cl. 260—615 B **19 Claims**

1. A process for the preparation of a hydroxy ether which comprises reacting an epoxide compound having not more than four carbon atoms in the ring with an organic hydroxy compound containing alcoholic or phenolic hydroxy groups in the liquid phase, in a molecular oxygen gaseous atmosphere, and in the presence of a catalytic amount of a catalyst consisting essentially of a palladium salt and a copper salt, at least a portion of the anion of said palladium or copper salt being a chloride ion.

4,118,427

CURABLE LIQUID HYDROCARBON PREPOLYMERS CONTAINING HYDROXYL GROUPS AND PROCESS FOR PRODUCING SAME

Robert A. Rhein, and John D. Ingham, both of La Canada, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 332,123, Feb. 13, 1973, abandoned. This application Jun. 28, 1973, Ser. No. 374,810

Int. Cl.[2] C07C *29/00*

U.S. Cl. 568—852 **18 Claims**

1. A process for producing a low molecular weight curable hydroxyl-containing liquid saturated hydrocarbon prepolymer from a high molecular weight saturated hydrocarbon parent polymer, comprising subjecting said saturated parent hydrocarbon polymer to ozonolysis by passing ozone into a solution of said parent polymer in an organic solvent which readily dissolves said saturated parent hydrocarbon polymer but which is inert and does not react readily with ozone, and which is selected from the group consisting of halogenated hydrocarbons and hydrocarbons, and degrading said polymer to produce a degraded ozonized polymer of reduced molecular weight, reducing said ozonized polymer in a hydrocarbon solvent for said ozonized polymer, and converting said ozonized polymer to said hydroxyl-containing liquid prepolymer

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4,118,428

PREPARATION OF ALKYL CHLORIDES

Annie H. Joustra; Teunis P. La Haye, and Fernand H. Keselaar, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 2, 1977, Ser. No. 764,835

Claims priority, application United Kingdom, Feb. 19, 1976, 6604/76

Int. Cl.[2] C07C *17/08*

U.S. Cl. 260—663 **9 Claims**

1. A process for the preparation of 2-chloroalkanes which comprises reacting a C_7 to C_{30} alpha olefin or mixture of such olefins with hydrogen chloride in the presence of a metal chloride supported on a carrier having an average pore diameter of at least 30 mμ.

4,118,429

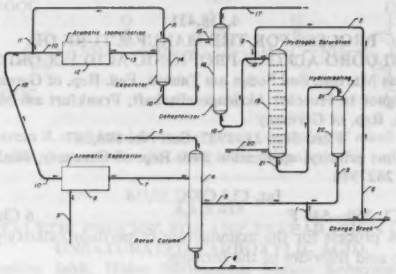
PRODUCTION AND RECOVERY OF PARA-XYLENE

Thomas R. Fritsch, Lombard, and Mark C. Anderson, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Sep. 26, 1977, Ser. No. 836,273

Int. Cl.[2] C07C *7/13, 5/22*

U.S. Cl. 260—674 SA **10 Claims**



1. A process for the production and recovery of para-xylene from a mixture of C_8-aromatic hydrocarbons, which process comprises the sequential steps of:

(a) contacting said mixture with a crystalline aluminosilicate adsorbent, in an adsorption-separation zone, at conditions selected to effect the selective retention therein of para-xylene;

(b) withdrawing a para-xylene deficient C_8-aromatic raffinate stream from said adsorption-separation zone and contacting said adsorbent with a desorbent to effect removal and recovery of para-xylene therefrom;

(c) introducing said raffinate stream into an aromatic isomerization reaction zone maintained at isomerization conditions which convert C_8-aromatic hydrocarbons into para-xylene and which effect the production of olefinic hydrocarbons;

(d) hydrotreating the resulting isomerization reaction zone effluent, in a hydrotreating zone, at hydrotreating conditions selected to (i) provide a liquid-phase operation and (ii) saturate said olefinic hydrocarbons without substantial saturation of C_8-aromatic hydrocarbons; and,

(e) introducing at least a portion of the resulting olefin-free reaction zone effluent into said adsorption-separation zone to recover additional para-xylene.

4,118,430

PROCESS FOR THE ISOMERIZATION OF HYDROCARBONS

John Mooi, Homewood, Ill., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 29, 1976, Ser. No. 681,375

Int. Cl.[2] C07C *15/08*

U.S. Cl. 260—668 A **9 Claims**

1. In a catalytic process for isomerizing aromatic hydrocarbon compounds containing 8 to 18 carbon atoms in the absence of added free molecular hydrogen wherein the catalyst is periodically regenerated with an oxygen-containing gas stream to remove carbonaceous deposits by converting said deposits to a carbon monoxide-containing gas mixture, the improvement comprising using as the catalyst a mixture consisting of

(1) about 80 to 99% by weight of a first component consisting of a particulate amorphous silica-alumina composition, and

(2) about 1 to 20% by weight of a second component consisting of a particulate amorphous silica-alumina composition and 0.05 ppm to 10% by weight of at least one metal or compound of a metal selected from rhenium, ruthenium, osmium, rhodium, iridium, palladium, platinum and mixtures of these.

4,118,431

CONVERSION OF OXYGENATED COMPOUNDS

Nai Yuen Chen, Titusville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 21, 1976, Ser. No. 734,481
Int. Cl.[2] C07C 5/00
U.S. Cl. 260—668 R **9 Claims**

1. In a process for effecting exothermic vapor phase chemical reactions of reactants comprising methanol, companion low boiling alcohols and derivatives thereof to form gasoline boiling hydrocarbons with a crystalline zeolite catalyst characterized by a pore opening of at least 5 Angstroms, a silica-alumina ratio of at least 12, and a constraint index within the range of 1 to 12 wherein in a fixed catalyst bed operation, the catalyst downstream of the reaction front becomes deactivated by a reaction product component, thereby substantially reducing utilization of the catalyst mass at its introduced activity to effect said exothermic reactions, the improvement to particularly limit undesired exposure of the catalyst downstream of the reaction front to deactivation by a reaction product which comprises,

passing the chemical reactants in vapor phase with said zeolite catalyst through a reaction zone containing a mixture of active catalyst particles and inert solid particle diluent thermophore material, the mass of active catalyst particles admixed with solid inert diluent thermophore material in a reaction zone being proportioned with respect to one another for any given and selected catalyst alpha activity in the range of 20 to 1000 alpha to more effectively utilize the particular alpha activity of the catalyst as the desired reaction front and catalyst pass through the reaction zone and effecting the reaction in the absence of significant undesired exposure of the active catalyst particles downstream of the reaction front to deactivating product of reaction before separation of catalyst from reaction products.

4,118,432

METHOD FOR DIMERIZATION OF OLEFINS

Viktor Alexandrovich Kabanov, Lomonosovsky prospekt, 14, kv. 108; Marina Alexandrovna Martynova, ulitsa Stasovoi, 4, kv. 34; Stanislav Konstantinovich Pluzhnov, pereulok Yazykovsky, 5, kv. 104, and Vladimir Ivanovich Smetanjuk, ulitsa Stasovoi, 4, kv. 34, all of Moscow, U.S.S.R.

Filed Mar. 18, 1977, Ser. No. 779,263
Int. Cl.[2] C07C 3/10
U.S. Cl. 260—683.15 D **3 Claims**

1. A method for dimerization of olefins containing 2 to 4 carbon atoms, comprising mixing at least one of said olefins in a medium of solvents selected from the group consisting of hydrocarbon and halogenated hydrocarbon solvents at a temperature within the range of from 0° to 100° C. under a pressure of from 1 to 40 atm with a two-component catalyst consisting of

(1) a complex of a nickel salt with a compound selected from the group consisting of tertiary phosphines and tertiary phosphites, and

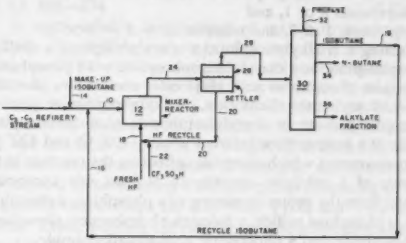
(2) an organoaluminum compound comprising a rubber swellable in said solvents and selected from the group consisting of natural and synthetic carbo-chain rubber with a content of 2 to 50 mol% of AlRX units, where R is an alkyl with at most 8 carbon atoms, X is a halogen; the atomic ratio of Al/Ni being varied within the range of from 1:1 to 100:1.

4,118,433

ISOPARAFFIN-OLEFIN HF ALKYLATION PROMOTED WITH TRIFLUOROMETHANESULFONIC ACID

Robert A. Innes, Wilkins Township, Allegheny County, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 362,425, May 21, 1973, abandoned. This application Aug. 29, 1974, Ser. No. 501,664
Int. Cl.[2] C07C 3/54
U.S. Cl. 260—683.51 **8 Claims**



4. In a process for the alkylation of isobutane with an olefinic hydrocarbon charge stock comprising at least one monoolefin selected from the group consisting of propylene, butene-1, pentene-1 and hexene-1 and wherein said alkylation is conducted in the presence of a catalyst comprising HF under reaction conditions including a reaction temperature from −20° C. to 30° C. and a pressure sufficient to maintain the HF in the liquid phase, the improvement which comprises conducting said alkylation process in the added presence of from 0.1 to 30 weight percent of trifluoromethanesulfonic acid based on the total weight of said catalyst and said trifluoromethanesulfonic acid.

4,118,434

HYDROALKYLATION USING MULTIMETALLIC ZEOLITE CATALYST

Timothy P. Murtha, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 5, 1976, Ser. No. 739,152
Int. Cl.[2] C07C 15/00
U.S. Cl. 260—668 R **11 Claims**

1. A process for producing monocyclic alkyl aromatic hydrocarbons and alkyl substituted monocyclic alkyl aromatic hydrocarbon which comprises: contacting a monocyclic aromatic hydrocarbon or an alkyl substituted monocyclic aromatic hydrocarbon under hydroalkylation conditions and in the presence of hydrogen with a catalyst consisting essentially of a calcined, acidic, nickel and rare earth-treated crystalline zeolite selected from the group consisting of Type X and Type Y zeolite support impregnated with at least one ruthenium compound subsequent to calcination.

4,118,435
CATALYZED PRODUCTION OF PHOSPHOROUS AND PHOSPHONOUS ACID ESTER CHLORIDES

Roland Kleinstück, and Hans-Dieter Block, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 27, 1977, Ser. No. 819,535
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636270
Int. Cl.² C07F 9/146
U.S. Cl. 260—972 **5 Claims**

1. In the production of phosphorous acid ester chlorides or phosphonous acid ester chlorides of the formula

$$R_m(R'O)_nPCl_{3-m-n}$$

wherein

R represents an alkyl radical containing 1 to 5 C-atoms, which may optionally be substituted by halogen or alkoxy groups, or it represents an aryl radical having up to 8 C-atoms,

R′ represents an alkyl radical having 1 to 15 C-atoms, optionally substituted by halogen, alkoxy groups or aryl groups, or it represents an optionally substituted aryl radical containing up to 8 C-atoms,

m represents 0 or 1, and

n represents 1 or 2, and wherein $m + n = 1$ or 2,

by reacting a trialkylphosphite, a triarylphosphite, a dialkylchlorophosphite or a diarylchlorophosphite with phosphorus-trichloride, phosphorus acid alkyl ester dichloride, phosphorous acid aryl ester dichloride, dialkylphosphonite plus dichloro-phosphonite or diarylphosphonite plus dichlorophosphonite at a temperature between about −10° C. and 120° C., the improvement which comprises effecting the reaction in the presence of a catalytic quantity of at least one compound selected from the group consisting of a phosphine, a phosphine oxide, a phosphine sulfide, a halogen-phosphorane, phosphoric acid-tris-amide and a phosphoric acid-tris-alkyl-amide.

4,118,436
ADHESIVE COMPOSITION

James M. Craven, 716 Westcliff Rd., Wilmington, Del. 19803

Filed Jun. 30, 1976, Ser. No. 701,747
Int. Cl.² C08L 23/34, 61/20
U.S. Cl. 260—826 **1 Claim**

1. An improved adhesive composition of:

(a) a chlorosulfonated polyethylene;

(b) methacrylic acid;

(c) an acrylic monomer selected from the group of butyl methacrylate, methyl methacrylate, 1,3 butylene dimethacrylate, or mixtures of these;

(d) the reaction product of butyraldehyde and aniline;

(e) cumene hydroperoxide; and

(f) 10–200 parts by weight of copper per million parts by weight of adhesive; the improvement used therewith comprises: 0.1–10 parts by weight, per 100 parts by weight of the reaction product, of a silane of the formula

$$NH_2(CH_2)_3—Si(OC_2H_5)_3$$

or

$$NH_2(CH_2)_2—NH—(CH_2)_3—Si(OCH_3)_3.$$

4,118,437
CROSS LINKABLE POWDER COATING COMPOSITIONS

Girish Girdhar Parekh, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 8, 1976, Ser. No. 674,797
Int. Cl.² C08L 63/00, 61/24, 61/20
U.S. Cl. 260—834 **10 Claims**

1. A polymeric finely-divided powder coating composition comprising a homogeneous blend of from about 70% to about 95%,by weight, of (A) a solid polymeric material having a molecular weight of from about 1,000 to about 100,000 and containing from about 1% to about 20%, by weight, of a carboxyl group and/or an alcoholic hydroxy group and/or an amide group, based on the total weight of said polymeric material and, correspondingly, from about 30% to about 5%, by weight of (B) tetrakismethoxymethylglycoluril, wherein said coating composition has a softening point above about 55° C., wherein the total combined weight of (A) and (B) is 100%.

4,118,438
TRANSPARENT NON-BLOCKING POLYPROPYLENE FILM AND ITS PREPARATION

Takeshi Matsui, and Kunihiko Arakawa, both of Inuyama, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 629,249, Nov. 6, 1975, abandoned, and a continuation-in-part of Ser. No. 535,594, Dec. 23, 1974, which is a continuation of Ser. No. 287,152, Sep. 7, 1972. This application Mar. 21, 1977, Ser. No. 779,625
Int. Cl.² C08L 77/00, 23/00
U.S. Cl. 260—857 L **7 Claims**

1. A transparent polypropylene film exhibiting good slip and non-blocking properties prepared by a process including the steps of:

admixing polypropylene with a thermoplastic resin in the melt state, the thermoplastic resin having a melting point higher than but no more than 100° C. higher than the melting p·int of the polypropylene and being substantially incompatible with the polypropylene under the mixation conditions, to produce a polypropylene composition wherein the thermoplastic resin is dispersed in the form of fine particles of 0.1 to 10μ in average particle size and the amount of the dispersing thermoplastic resin is from 0.01 to 1% by weight of the polypropylene,

extruding the polypropylene composition in the melt state into a film, and

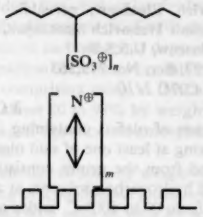
stretching the film at a draw ratio of 4 or more times in at least one direction.

4,118,439
POLYELECTROLYTES

Xavier Marze, Lyons, France, assignor to Rhone-Poulenc S.A., Paris, France

Continuation of Ser. No. 268,066, Jun. 30, 1972. This application Jan. 31, 1977, Ser. No. 764,176
Claims priority, application France, Jul. 2, 1971, 71.24235
Int. Cl.² C08L 33/20
U.S. Cl. 260—858 **31 Claims**

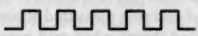
1. An ionically cross-linked, shaped or unshaped, polymer, which is insoluble in water, but soluble in a liquid organic medium without the presence of an ionic shielding solvent which contains less than one hydrophilic group per 12 carbon atoms and which corresponds to the formula:



(I)

in which: the symbol N⊕ represents a quaternary nitrogen-containing group; the symbol

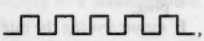
represents a macromolecular chain carrying groups which are capable of being linked, via a covalent bond, to $-SO_3^{\ominus}$ groups, the symbol



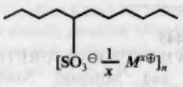
represents a macromolecular chain carrying groups which can give rise to the formation of $N^{\oplus}$ groups, the symbol

indicating that the $N^{\oplus}$ groups are linked to the macromolecular chain by at least one covalent bond, and the chains

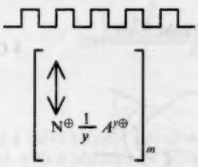
and

 ,

considered together, do not contain oppositely charged groups which are capable of forming inter-chain covalent bonds, the ratio n/m is between 0.1 and 10; and the nature of the units forming the macromolecular chains and the values of n and m being such that a polymer of the formula (I_1)



in which M represents a hydrogen ion or an alkali metal or alkaline earth metal ion and x is 1 or 2, and a polymer of formula (I_2)



in which A represents a hydroxyl radical or the anion of an inorganic or organic acid of formula: AH_y, y being equal to 1, 2 or 3, said polymers of formulae (I_1) and (I_2) both insoluble in water, but soluble in a common liquid organic medium without the presence of an ionic shielding solvent and wherein the macromolecular chain which is linked via a covalent bond to $-SO_3^{\ominus}$ groups and the macromolecular chain which is liked via a covalent bond to $N^{\oplus}$ groups both possess a specific viscosity of greater than 0.01 measured at 25° C. on a 2 g/liter solution in dimethylformamide.

4,118,440

CROSSLINKED VINYL HALIDE POLYMERS AS FLAME RETARDANT ADDITIVES FOR THERMOPLASTIC POLYESTER

Jung Il Jin, Irvington, and Paul Kraft, Spring Valley, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 512,773, Oct. 7, 1974, Pat. No. 4,022,849, which is a division of Ser. No. 395,684, Sep. 10, 1973, abandoned. This application Nov. 15, 1976, Ser. No. 741,650

Int. Cl.[2] **C08L** *67/02;* **G08L** *67/06*

U.S. Cl. 260—873 **6 Claims**

1. A fire retardant polyblend of at least on polyester resin, formed by the condensation of a dicarboxylic acid and a dihydric alcohol, in intimate admixture with an effective flame retarding concentration of at least one crosslinked copolymer consisting of:

(1) from about 50% to about 99%, by weight of the crosslinked copolymer, of at least one vinyl halide selected from the group consisting of vinyl chloride, vinyl bromide, and vinyl fluoride;

(2) from about 1% to 50%, by weight of the crosslinked copolymer, of at least one polyfunctional ethylenically unsaturated monomer; and

(3) from about 0% to 49%, by weight of the crosslinked copolymer, of a comonomer selected from the group consisting of the vinylidene halides, and the vinyl and allyl phosphonates.

4,118,441

BENEFICIATING AGENT COMPOSITION

John R. Le Blanc, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 250,619, May 5, 1972, Pat. No. 3,816,308. This application May 15, 1974, Ser. No. 470,252

Int. Cl.[2] **C08L** *33/02;* **C08K** *7/00*

U.S. Cl. 260—874 **5 Claims**

1. A water-soluble composition of matter to improve the yield of a clay drilling mud, consisting essentially of a mixture of (A) from 95 to 20% by weight of a polymer of at least one carboxylic acid monomer selected from the group consisting of acrylic acid, methacrylic acid, maleic anhydride, maleic acid, crotonic acid, itaconic acid, mesaconic acid, and citraconic acid, and (B) from 5 to 80% by weight of at least one water soluble sulfate, nitrate, chloride or aliphatic monocarboxylic acid salt of a metal selected from the group consisting of lead and metals from Groups IB, IIB, VIB, VIIB, and VIII of the Periodic Table; wherein the carboxylic acid polymer is characterized as having a carboxylic acid monomer content in the range of from 20 to 100 mol percent, a number average molecular weight of at least 5,000 and a solubility in water at a pH of less than 7 of at least 1% by weight at 25° C.; wherein the salt has a water solubility of at least 1% by weight at a pH less than 7; and wherein said aliphatic monocarboxylic acid contains 1 to 4 carbon atoms.

5. A composition of claim 1 which further includes a polyacrylamide flocculating atent.

4,118,442

ANAEROBIC PRESSURE SENSITIVE ADHESIVE COMPOSITION

Maurice Douek, Beverly Hills; Gustav A. Schmidt, South Pasadena, both of Calif.; Bernard M. Malofsky, Bloomfield, and Martin Hauser, West Hartford, both of Conn., assignors to Avery Products Corporation, San Marino, Calif. and Loctite Corporation, Newington, Conn., part interest to each

Division of Ser. No. 443,223, Feb. 19, 1974, Pat. No. 3,996,308. This application Sep. 17, 1976, Ser. No. 724,148

Int. Cl.[2] **C08L** *33/08*

U.S. Cl. 260—885 **12 Claims**

1. A curable, essentially solvent free anaerobic pressure sensitive adhesive composition comprising a mixture of:

(a) about 35 to about 99 percent by weight of an anaerobic resin system which is stable in the presence of oxygen and which contains at least one anaerobically curable resin having at least one polymerizable acrylate ester moiety;

(b) about one to about 65 percent by weight of a thermoplastic polymer system containing at least one high molecular weight acrylic-based polymer, capable of combining a substantial quantity of said anaerobic resin system;

(c) about 0.5 to about 20 percent, based on the total weight of (a) and (b), of a catalyst system for said anaerobic resin system, said catalyst system comprising a peroxy compound, an organic compound for accelerating cure of said anaerobic resin system and a stabilizer for said anaerobic

resin system, said anaerobic pressure sensitive adhesive, when in an essentially solvent-free state, being permanently tacky at room temperature and having a static shear strength of at least about two minutes at a 250 gram load per 0.25 square inch and a 180° peel value of at least about 0.5 lb. per inch, and curable upon substantial exclusion of oxygen.

4,118,443

PRODUCTION OF ACID PHOSPHORIC ACID ESTER SALTS

Werner Klose, Erfstadt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,054

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602289

Int. Cl.² C07F 9/09

U.S. Cl. 260—980 **5 Claims**

1 In a process for making a product, which consists essentially of an acid orthophosphoric acid ester salt and contains at most about 1 weight % of water, and of which the inert ester group R (inert with respect to the reactants) being an alkyl, cycloalkyl, polyalkoxyalkyl, aryl, polyalkoxyaryl, alkaryl or aralkyl group contains 1 to 50 carbon atoms, whereby the carbon chain or ring of the ester group R and the salt-forming cation M is a mono- or bivalent metal ion or an ammonium ion, the improvement which comprises: reacting, at temperatures of about 0° to 150° C., with thorough agitation, molar proportions of P_2O_5 and of a compound of the general formulae M_2O, M_2CO_3, MO or MCO_3 with $2/m$ mol of an at least partially liquid or molten organic hydroxyl compound of the general formula $R(OH)_m$, in which formulae the substituents M and R have the meanings given above and m is a number of 1 to 4; terminating the reaction, cooling the resulting reaction product and pulverizing it, if desired.

4,118,444

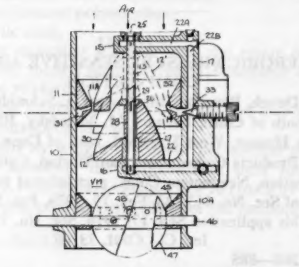
VARIABLE VENTURI CARBURETION SYSTEM

Harold G. Abbey, 11 Goldsmith Dr., Holmdel, N.J. 07733

Filed Oct. 8, 1976, Ser. No. 730,956

Int. Cl.² F02M 9/14

U.S. Cl. 261—44 A **2 Claims**



1. A carburetion system for supplying a fuel-air mixture to an internal combustion engine in a manner maintaining a desired ratio of fuel-to-air under varying conditions of engine demand to improve fuel economy and minimize the emission of pollutants, said system comprising:

A. a carburetor having a variable-Venturi structure mounted within a tubular casing and having a converging inlet to a throat and a diverging outlet therefrom, all having a circular cross-sectional area, control means to mechanically adjust the effective area of the throat of the Venturi without introducing discontinuities in the converging inlet to the throat and in the diverging outlet therefrom which leads into a mixing chamber, a fuel feed means including a metering device concurrently operated by said control means to introduce fuel into the throat of said structure to be intermixed in said chamber with air passing through said Venturi structure to produce said fuel-air mixture; said variable-Venturi structure including a fixed ring mounted on said casing and having a triangular cross-section with a flattened apex, a plug axially movable within said casing relative to said ring, said plug having a truncated conical shape whose base has a diameter slightly smaller than the diameter of said ring measured across said apex to provide a constricted throat when said base in in line with said apex, said plug having a head whose diameter is small with respect to said apex diameter to provide an enlarged throat when said head is in line with said apex, a guide post coaxially mounted in said casing and cantilevered upper and lower arms extending from a vertical column to support said post, said post passing through a central bore in said plug whereby said plug is slidable on said post between the limits of said arms, said post and said arms being hollow to provide ducts for supplying fuel thereto, said post having jet openings in line with said apex to eject fuel into said throat through slots in said plug;

B. means sensing the rate of air flowing through said Venturi structure as a function of engine demand to produce a control signal dependent thereon;

C. a motor operating said control means; and

D. means responsive to said control signal to govern said motor to adjust said control means in a direction and to an extent maintaining the desired fuel-to-air ratio under varying conditions of engine demand.

4,118,445

SLIDING THROTTLE VALVE TYPE CARBURETOR

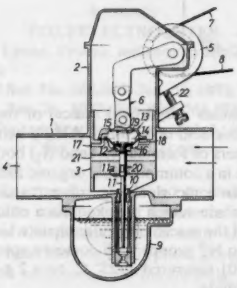
Toshimasa Shishido, Tokyo, and Mitsuaki Ninomiya, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Keihinseiki Seisakusho, Kawasaki and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Dec. 22, 1976, Ser. No. 753,379

Claims priority, application Japan, Mar. 18, 1976, 51-32620[U]

Int. Cl.² F02M 9/06

U.S. Cl. 261—44 B **4 Claims**



1. A carburetor for internal combustion engines of a sliding throttle valve type, comprising: an air intake barrel having an air-intake passage therein, a main nozzle arranged to open into said air-intake passage, a guide cylinder arranged at one side of said air-intake barrel in opposite relation with said main nozzle, a throttle valve slidably fitted in said guide barrel and operable to open and close said air-intake passage, a movable element mounted in said throttle valve for vertical sliding movement relative thereto and operable to control mixture supply from said main nozzle to said air-intake passage, and means for controlling vertical movement of said movable element relative to said throttle valve for displacing said movable element, in response to a negative pressure of a predetermined value and

above in said air-intake passage downstream of said throttle valve generated due to deceleration of an engine associated with said carburetor, relative to said throttle valve in a direction away from said main nozzle so as to increase the amount of mixture fed from said main nozzle to said air-intake passage, said movable element comprising a jet needle having an upper portion slidably fitted in said throttle valve and a tapered lower portion inserted into said main nozzle, said means for controlling vertical movement of said movable element comprising a negative pressure responsive device operatively connected with said jet needle, said throttle valve having a secondary air passage formed therethrough for communication between the upstream side and the downstream side of said air-intake passage, said secondary passage being normally closed and being opened in accordance with upward movement of said jet needle relative to said throttle valve, said jet needle including a cylindrical upper portion slidably fitted in said throttle valve, said cylindrical portion being provided at its periphery with an annular groove which is normally out of register with said secondary air passage, said annular groove being placed into register with said secondary air passage to open the latter when said jet needle has been moved upwardly to a predetermined extent relative to said throttle valve.

4,118,446

VALVE TRAY FOR MASS-EXCHANGE APPARATUS

Viktor Leontievich Burin, ulitsa Derevyanko, 21a, kv. 26; Anatoly Borisovich Tjutjunnikov, ulitsa Frunze, 17, kv. 34; Viktor Nikolaevich Golosov, ulitsa Sverdlova, 190/9, kv. 53; Evgeny Konstantinovich Tarynin, ulitsa Otakara Yarosha, 41, kv. 17, all of Kharkov; Nikolai Pavlovich Pogorely, Kharkovskoi oblasti, pereulok Merefyansky, 41, Merefa, and Vladimir Matveevich Lukyanenko, ulitsa Levanevskogo, 8, kv. 39, Sumy, all of U.S.S.R.

Filed Aug. 30, 1974, Ser. No. 502,231
Int. Cl.[2] B01D *3/18*
U.S. Cl. 261—114 VT **9 Claims**

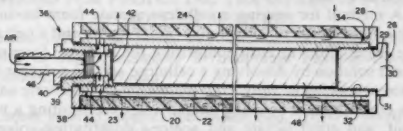
1. In a valve tray for a mass-exchange apparatus, a baseplate formed with a plurality of holes through which an upwardly moving fluid is adapted to pass in countercurrent to a downwardly flowing liquid, said baseplate having at each hole opposed upwardly directed surface portions extending along each hole, and a plurality of valves resting on said baseplate respectively over said holes thereof with each valve having on one side an elongated opening-and-closing edge region engaging along its entire length one of said upwardly directed surface portions at each hole of said baseplate when each valve is in its closed position, and each valve having opposite from its opening-and-closing edge region an elongated rocking region engaging along its entire length an upwardly directed surface portion of the baseplate opposite from the surface portion thereof at each hole which is engaged by the opening-and-closing edge region of each valve, each valve having a center of gravity situated over the hole which is closed by each valve when the latter is in its closed position, and said rocking region providing for each valve a turning axis situated at a given distance from the center of gravity of each valve when the latter is in its closed position, said rocking region of each valve having a downwardly directed convexly curved surface which in a plane normal to said turning axis is of a substantially cylindrical configuration and which displaces said turning axis away from said center of gravity to an increasing extent as each valve moves at said opening-and-closing edge region thereof upwardly away from said baseplate during continued opening movement of each valve in response to pressure of upwardly flowing fluid, whereby the moment arm with which the center of gravity of each valve acts to urge each valve back toward its closed position continuously increases with increased opening of each valve so that increased fluid pressures which open said valves to increasing degrees are accompanied by increasing closing moments tending to return the valves to their closed positions.

4,118,447

AERATOR CONTAINING A BALLAST CHARGE

Rolf Richter, East Greenwich, R.I., assignor to Xodar Corporation, Greenville, R.I.

Filed Jun. 20, 1977, Ser. No. 807,873
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—122 **10 Claims**



1. An aeration diffuser, comprising in combination: an elongate, substantially tubular and stiff outer member formed of a gas permeable material, and a tubular inner member containing a ballast charge for holding the diffuser submerged in a pool of water, said inner member being disposed within said outer member and spaced from the surrounding wall of said outer member;

a first end cap closing one end of said outer member and mechanically supporting one end of said inner member in spaced relation with said outer member; and

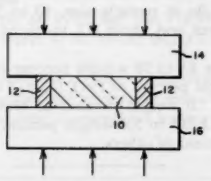
a combination second end cap and inlet assembly closing the other end of said outer member and mechanically supporting the other end of said inner member in spaced relation with said outer member; said end cap and inlet assembly being adapted for connection to a source of compressed air.

4,118,448

PREPARATION OF HIGH STRENGTH HALIDE BODIES

Rogers H. Anderson, Long Lake, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 634,394, Nov. 24, 1975, abandoned, which is a continuation of Ser. No. 445,371, Feb. 25, 1974, abandoned. This application May 26, 1977, Ser. No. 800,675
Int. Cl.[2] C04B *35/64*
U.S. Cl. 264—1 **13 Claims**



1. A method of forming a fine-grained halide optical element, the method comprising:

heating an essentially single crystal alkali halide body to a temperature at which essentially generalized flow can occur but not so high that substantial grain growth occurs during processing;

applying compressive force to the halide body to reduce the dimension of the halide body along a first axis and producing a corresponding expansion of the halide body in direc-

tions other than along the first axis thereby producing a fine-grained structure in the halide body; and,

constraining the halide body in directions other than along the first axis, during the heating and applying force steps from the commencement of applying compressive force, to inhibit crack formation in the halide body.

4,118,449

METHOD OF MAKING A CELLULOSE ACETATE LOW DENSITY MICROCELLULAR FOAM

James A. Rinde, Livermore, Calif., assignor to The United States of America as presprented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 609,641, Sep. 2, 1975, Pat. No. 4,012,265. This application Dec. 9, 1976, Ser. No. 749,205

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—28 **9 Claims**

1. A method for making a cellulose acetate foam having a density in the range of 0.065 to 0.6 $\times$ 10^3 kg/m^3 and a cell size in the range of 0.3 to 2μm comprising the steps of: forming a polymer solution by dissolving a cellulose acetate polymer in a solution consisting of anhydrous magnesium perchlorate anhydrous constituting a swelling agent, water constituting a non-solvent, and ethyl lactate and acetone constituting solvents such that the cellulose acetate is in the range of from 3% to not greater than 22%; shaping the solution; gelling the thus shaped polymer solution by directing same into a water bath maintained at a temperature of 0°–10° C.; soaking the shaped gel in a water bath having a temperature of about 0°–30° C. for sufficient time to substantially diffuse out solvents and swelling agents; freezing the thus soaked gel; and freeze-drying the shaped gel wherein water and solvents sublime and the gel structure solidifies into foam having a cell size ranging from 0.3 to 2μm and a density in the range of 0.065 to 0.6 $\times$ 10^3 kg/m^3.

4,118,450

METHOD FOR PRODUCING INORGANIC POROUS SHAPED MATERIAL

Ryuji Nakamura, Mino, and Hideo Motogi, Ibaragi, both of Japan, assignors to Shikoky Kaken Kogyo Kabushiki Kaisha, Ibaragi, Japan

Continuation-in-part of Ser. No. 469,871, May 14, 1974, abandoned. This application Oct. 27, 1976, Ser. No. 736,233

Int. Cl.[2] C04B *35/64*

U.S. Cl. 264—43 **7 Claims**

1. A method for producing an inorganic porous shaped product comprising the steps of mixing silica dust with water, shaping the mixture, drying the shaped product to adjust the water content thereof to 1 to 10 weight percent and thereafter firing the shaped product at a temperature of 1000° to 1450° C., said silica dust being:

(i) a by-product from the process of producing ferrosilicon by electrothermal metallurgy, and

(ii) 0.1 to 1.0μ in particle size, 10 to 50 m^2/g in specific surface area and about 0.1 to about 0.3 g/cm^3 in bulk density,

and comprising 85 to 98 weight percent of amorphous silica, 0.2 to 2.0 weight percent of FeO, 0.2 to 5.0 weight percent of Al_2O_3, 0.5 to 2.0 weight percent of MnO, 0 to 0.1 weight percent of CaO, 0.5 to 5.0 weight percent of MgO and 0.1 to 1.5 weight percent of others.

4,118,451

METHOD OF CONTROLLING FOAMING OF CABINET INSULATION

John Joseph Schaus, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

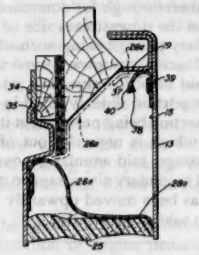
Filed May 2, 1977, Ser. No. 793,074

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—46.5 **15 Claims**

1. The method of controlling the forming of a foamed-in-place insulation in a cabinet structure having an inner liner and an outer shell, said liner having an outer surface and said shell having an inner surface in outwardly spaced confronting relationship to said outer surface to define an insulating space therebetween having a front opening, said method comprising the steps of:

securing a first portion of a deflectible sheet to one of said surfaces adjacent said opening with the remainder of the sheet being free for movement, said sheet having a stiffness preselected to cause said remainder of the sheet to project away from said one surface;



inserting said liner into said shell to define said insulation space therebetween; and

introducing expandable foam insulating material into said insulation space to foam therein so as to substantially fill said insulation space and concurrently deflect said remainder of the sheet toward said front opening and into engagement with the other of said surfaces, said sheet extending between said liner and shell surfaces to define an outer boundary of the foamed insulation fully across said opening.

4,118,452

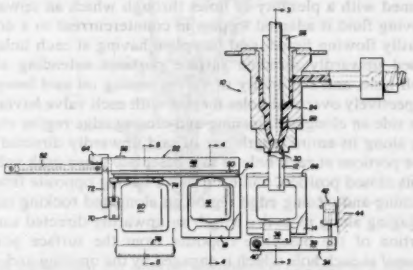
TWO-STAGE PROCESS FOR INDUSTRIAL BLOW MOLDING

Robert A. Myers, Sylvania, and Albert R. Uhlig, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 558,952, Mar. 17, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,196

Int. Cl.[2] B29C *17/07*

U.S. Cl. 264—89 **3 Claims**



1. In a method of blow molding, the steps of:

(1) extruding a pendant tubular parison from an orifice located above and in vertical alignment with a pre-form blow mold,

(2) interposing a transfer mechanism between the orifice and the pre-form blow mold, the transfer mechanism being movable in a horizontal plane relative to said pre-form blow mold and said orifice;

(3) substantially simultaneously (a) engaging the parison intermediate the orifice and the pre-form blow mold with the transfer mechanism, and (b) closing the pre-form blow

mold on that portion of said parison beneath said transfer mechanism,

(4) severing the parison at the orifice and blowing the parison to a blown pre-form interiorly of said preform blow mold;

(5) opening the pre-form blow mold to expose the blown preform still engaged by the transfer mechanism and freely pendant therefrom,

(6) horizontally moving the transfer mechanism and the blown pre-form from alignment with the pre-form blow mold and into alignment with an open final blow mold,

(7) closing the final blow mold onto the blown pre-form still engaged by and still pendant from said transfer mechanism,

(8) releasing the pre-form form the transfer mechanism after the performance of Step (7),

(9) again interposing the transfer mechanism between the orifice and the pre-form blow mold, for engagement with a subsequently extruded parison, and

(10) blowing the blown pre-form interiorly of said final blow mold.

4,118,453

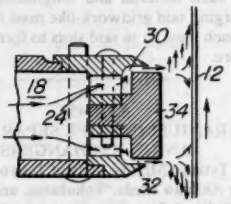
METHOD AND APPARATUS FOR THE EXTRUSION OF TUBULAR THERMOPLASTIC FILM

F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,692

Int. Cl.[2] B29D *23/04*

U.S. Cl. 264—89 **4 Claims**



1. In a process for the production of thermoplastic film by melting a thermoplastic material, extruding the molten thermoplastic material through an annular die to form an extruded tube of molten material, cooling the extruded tube while drawing the tube so cooled, expanding the tube to attenuate the walls thereof by introducing a gas to the interior of the tube, and flowing a cooling gas in contact with the outer surface of said tube from a plurality of circular pairs of annular zones about said extruded tube spaced along the axis thereof and being of increasing diameter in the direction away from the point of extrusion as aforesaid; the improvement whereby flutter of the expanding film tube is reduced during expanded cooling thereof which comprises directing separate pairs of cooling gas confined streams against said film on each side of a shape restricting surface which extends beyond the discharge boundaries of the discharged confined streams, said cooling gas passed in contact with the outer surface of said film tube at each of said shape restricting surfaces to produce a positive gas pressure zone between said surface and said film material and withdrawing said cooling gas from such contact between each pair of adjacent cooling gas inlets.

3. In apparatus for the production of blow plastic material comprising an annular die, means to supply molten thermoplastic material to said die under pressure to force said material through said die and thereby generate a moving tube of said material, means to introduce a gas under pressure within said moving tube to expand said tube to a bubble of film and attenuate the walls thereof, a series of cooling and shape imposing ring surfaces about said bubble of film concentric therewith and of increasing diameter in the direction of movement of said tube of material from adjacent said die to adjacent a downstream point of said expanded bubble at which said material has cooled to a film state of substantial dimensional stability; the improvement which comprises providing cooling gas annular outlet slots each side of said rings formed to present a flat annular restricting surface for the expanding bubble of film, walls defining a plenum chamber about said annular restricting surface for supplying cooling gas to said annular outlet slots, said flat ring surface extending slightly beyond the discharge boundary of said annular slots, flowing cooling gas through said annular slots each side of said flat restricting surface sufficient to maintain a zone of cooling gas between said flat surface and said film under positive pressure conditions and collecting and withdrawing cooling gas so introduced between rings arranged as above provided.

4,118,454

METHOD FOR PRODUCING TRANSPARENT PLASTIC MOLDED ARTICLES

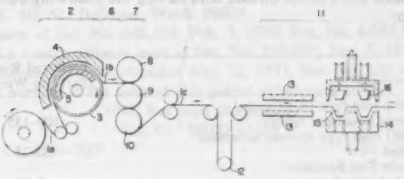
Kyosuke Miki, Yokohama, and Masahiro Takeuchi, Yamato, both of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Aug. 27, 1976, Ser. No. 718,325

Claims priority, application Japan, Sep. 2, 1975, 50-105614; Sep. 2, 1975, 50-105615

Int. Cl.[2] B29C *17/04*

U.S. Cl. 264—93 **9 Claims**



1. A method for producing a transparent polypropylene molded article comprising heating a polypropylene sheet to a temperature not lower than the melting point of the sheet, stretching the sheet at said temperature at a stretching ratio of at least 5%, rapidly cooling it to a temperature of not more than 120° C., and then subjecting the thus treated sheet to thermoforming including reheating to and forming at a temperature below the melting point of the sheet.

4,118,455

SOFT RUBBER STEERING WHEEL, COMPOSITION AND METHOD OF MANUFACTURE

James H. Byrn, Portland, Ind., assignor to Sheller-Globe Corporation, Toledo, Ohio

Filed Feb. 24, 1977, Ser. No. 771,791

Int. Cl.[2] B29H *3/08, 19/00;* B62D *1/04*

U.S. Cl. 264—129 **5 Claims**

1. A method of forming a cover on a steering wheel of the type having a hub, spokes and an annular metal core, comprising the steps of furnishing a compound having the following ingredients:

Ingredient	Preferred Range (Parts by Weight)
[SBR] cold type oil-extended styrene butadiene rubber	100–135
[SBR] cold type styrene butadiene rubber	10–25
Whole Tire Reclaim (Non-staining)	5–25
[Dixie Clay] kaolin	10–40
[FEF Black] carbon black	20–80
Sulfur	3–6
Zinc Oxide	1–10
[Altax] benzothiazyl disulfide	0.1–2.0

-continued

Ingredient	Preferred Range (Parts by Weight)
[Cumate] copper dimethyl dithiocarbamate	0.1–2.0
[Circosol 450 Oil] naphthenic oil	20–60

and injection molding said compound around said core to form a rim section cover on the steering wheel.

3. A soft rubber composition for use in the manufacture of steering wheel rim covers comprising the following:

Ingredient	Preferred Range (Parts by Weight)
[SBR] cold type oil-extended styrene butadiene rubber	100–135
[SBR] cold type styrene butadiene rubber	10–25
Whole Tire Reclaim (Non-staining)	5–25
[Dixie Clay] kaolin	10–40
[FEF Black] carbon black	20–80
Sulfur	3–6
Zinc Oxide	1–10
[Altax] benzothiazyl disulfide	0.1–2.0
[Cumate] copper dimethyl dithiocarbamate	0.1–2.0
[Circosol 450 Oil] naphthenic oil	20–60

4. A steering wheel having a hub, spokes radiating from said hub, an annular metal core secured to the outer ends of said spokes, and a cover on said core having the following composition:

Ingredient	Preferred Range (Parts by Weight)
[SBR] cold type oil-extended styrene butadiene rubber	100–135
[SBR] cold type styrene butadiene rubber	10–25
Whole Tire Reclaim (Non-staining)	5–25
[Dixie Clay] kaolin	10–40
[FEF Black] carbon black	20–80
Sulfur	3–6
Zinc Oxide	1–10
[Altax] benzothiazyl disulfide	0.1–2.0
[Cumate] copper dimethyl dithiocarbamate	0.1–2.0
[Circosol 450 Oil] naphthenic oil	20–60

4,118,456

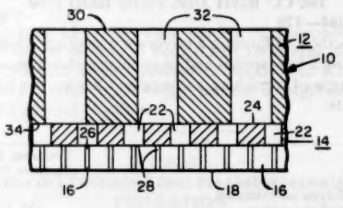
EXTRUSION DIE

Wendell S. Blanding, Painted Post, and Robert V. Van Dewoestine, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,153

Int. Cl.[2] B29F *3/00*

U.S. Cl. 264—177 R **9 Claims**



1. An extrusion die for forming honeycomb structures comprising, a first body member having an inlet face and an outlet face, a plurality of interconnected discharge slots formed in said first body member and communicating with said outlet face, a plurality of relatively short feed holes of limited diameter formed in said body member and communicating between selected intersecting portions of said interconnected discharge slots and said inlet face, a second body member having an entrance face and an exit face, a plurality of relatively long, individual, spaced-apart feed passageways extending through said second body member between said entrance face and said exit face of a diameter larger than the diameter of said relatively short feed holes formed in said first body member, said first and second body members being joined together with the exit face of said second body member adjacent the inlet face of said first body member to form an integral extrusion die, and each of said individual feed passageways formed through said second body member directly communicating with a plurality of said feed holes formed in said first body member which in turn communicate with selected intersecting portions of said interconnected discharge slots.

6. A method of extruding a honeycomb structure having thin wall portions not exceeding about 0.05" which comprises, providing extrudable batch material to the inlet end of a plurality of relatively long, individual, spaced-apart feed passageways having relatively large diameters, longitudinally flowing for a relatively long distance such batch material through said relatively large diameter feed passageways, flowing such batch material from each of said relatively large individual feed passageways directly into a plurality of relatively short and relatively small diameter feed holes, continuing the longitudinal flow of such batch material for a relatively short distance through said relatively small diameter feed holes to the intersections of a plurality of interconnected discharge slots, simultaneously flowing such batch material transversely between the intersections of such slots to form a coalesced gridwork-like mass of such material and longitudinally of such slots before discharging said gridwork-like mass from said slots, and discharging such mass from said slots to form a cellular honeycomb structure.

4,118,457

REDOX URANIUM ISOTOPE SEPARATION USING ANION EXCHANGERS

Maomi Seko; Tetsuya Miyake, both of Tokyo; Kunihiko Takeda, Yokohama; Akihiko Ikeda, Yokohama, and Kazuo Imamura, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1976, Ser. No. 687,844

Claims priority, application Japan, Jun. 3, 1975, 50-66884

Int. Cl.[2] B01D *59/30*

U.S. Cl. 423—7 **9 Claims**

1. In a process for separation of uranium isotopes by displacing at least one redox boundary formed between an adsorption zone of uranium isotope mixture and a reducing agent or an oxidizing agent through a system of anion exchanger while conducting a redox reaction at said boundary thereby to concentrate at least one isotope in the region near said boundary, the improvement which comprises using as anion exchange an anion exchanger particle with a size of 1 mm or less in diameter compris- a three-dimensionally crosslinked polymer containing functional groups having anion exchange capacity of 0.2 milliequivalents or more per gram of dry resin and having a self-diffusion coefficient of uranyl ion of at least 1×10^{-7} cm^2/sec.

4,118,458

SEPARATING MAGNESIUM AND CALCIUM FROM MINERAL MIXTURES CONTAINING ZINC SULPHIDES

Murry C. Robinson, 178 Brookbanks Dr., Don Mills, Ontario, Canada

Continuation of Ser. No. 359,322, May 11, 1973, abandoned. This application Sep. 19, 1977, Ser. No. 834,744

Claims priority, application United Kingdom, May 12, 1972, 22521/72

Int. Cl.[2] C01G *9/08*

U.S. Cl. 423—109 **7 Claims**

1. The process for treating a mineral mixture containing zinc sulphides and at least one of magnesium and calcium in the

form of carbonates, oxides or hydroxides to effect separation of at least a part of said magnesium and calcium constituents from said zinc sulphides which comprises leaching said mineral mixture with an aqueous sulphur dioxide bearing solution at a temperature below 100° C. to put magnesium and calcium into solution as bisulphites, continuously adding sulphur dioxide to said solution during said leaching at a rate sufficient to maintain the pH thereof at a level within the range of about 1.7 to about 2.5, maintaining the total sulphur dioxide content of the leach slurry at a level to dissolve magnesium and calcium at a preferential rate as compared to the rate of dissolution of zinc in said zinc sulphides, said total sulphur dioxide content level being between about 90 and about 45 g/l when the pH is about 1.7 and between about 20 g/l when the pH is about 2.5, and containing said leaching with said sulphur dioxide addition to produce a solution containing dissolved magnesium and calcium bisulphites and a residue containing the major portion of said zinc sulphides in concentrated form and recovering said solution and residue as separate products.

4,118,459
CHEMICALLY REMOVING IRON FROM GRITS

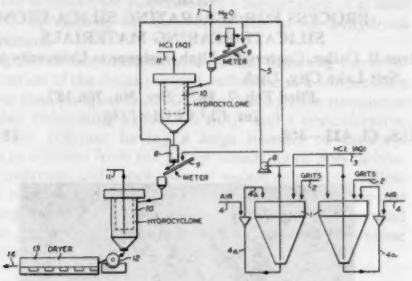
Wilhelm Falkenhain, Niederkassel-Ranzel, and Ernst Feder, Troisdorf, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf Bez. Koeln, Germany

Continuation of Ser. No. 492,810, Jul. 29, 1974, abandoned. This application Feb. 7, 1977, Ser. No. 766,420

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1973, 2338937

Int. Cl.[2] C01G *49/02, 53/10*

U.S. Cl. 423—142 **13 Claims**



1. In a process of removing iron from grits of brown or white corundum, silicon carbide, zirconium corundum or garnet having a Mohs hardness of 7 to 9, with hydrochloric acid wherein:

(a) a mixture of the grits and aqueous hydrochloric acid is agitated for removal of the iron from the grits and the provision of a first suspension of the grits in an aqueous hydrochloric acid medium in which the iron is dissolved, and the aqueous hydrochloric acid medium is removed from the grits, the improvement which comprises passing the grits serially through at least two hydrocyclones having no moving parts, adding water to the feed to each hydrocyclone, and in each hydrocyclone separating aqueous hydrochloric acid and forming a specifically heavier fraction containing the grits,

(b) for the first hydrocyclone separation, adding water to said first suspension to form a second suspension and feeding the second suspension tangentially into the first hydrocyclone for centrifuging the second suspension in the first hydrocyclone and thereby separating therefrom a specifically lighter fraction rich in the hydrochloric acid and a first specifically heavier fraction rich in grits, the first specifically heavier fraction being removed from the bottom of the hydrocyclone,

(c) for the second hydrocyclone treatment, adding water to said first specifically heavier fraction to form a third suspension and feeding the third suspension tangentially into a second hydrocyclone for centrifuging the third suspension in the second hydrocyclone and thereby separating the third suspension into a second specifically lighter fraction rich in hydrochloric acid and a second specifically heavier acid-free fraction rich in grits, the second specifically heavier acid-free fraction being removed from the bottom of the second hydrocyclone, and

(d) the specifically heavier fraction produced in last hydrocyclone is filtered for preliminary dewatering to provide a filter cake containing the grits and the filter cake is dried to provide dried grits substantially free of iron,

(e) said first suspension is continuously supplied to step (b) and the subsequent steps are performed continuously.

4,118,460
REMOVAL OF NITROGEN OXIDES FROM INDUSTRIAL GASES BY USE OF OXIDIZING SOLUTIONS IN WHICH NITRATES ARE THE OXIDANTS

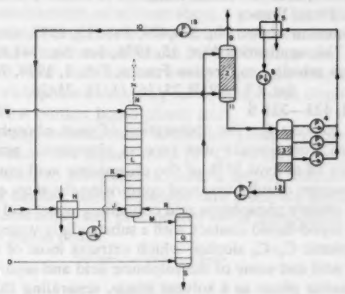
Donald W. Bolme, c/o Donald W. Bolme & Associates, 10655 NE. 4th St., Bellevue, Wash. 98004

Division of Ser. No. 548,104, Feb. 7, 1975, Pat. No. 4,053,555, and a continuation-in-part of Ser. No. 259,402, Jun. 5, 1972, abandoned. This application Aug. 22, 1977, Ser. No. 826,638

The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—235 **21 Claims**



1. A method of removing the sparingly soluble compound nitric oxide from industrial gases comprising an admixture of said nitric oxide and at least one other gas and recovering said nitric oxide in concentrated form, said process including the steps of: oxidizing the nitric oxide to the soluble trivalent state by so contacting it with an aqueous, nitrate ion containing solution as to effect the reaction

$$2NO + NO_3^- + H_2O \rightarrow 3NO_2^- + 2H^+;$$

dissolving the trivalent material in the water present in said solution to thereby separate the trivalent material from said gases; and stripping the dissolved trivalent nitrogen material from the aqueous solution, the concentration of nitrate ion in said solution being maintained in the range of 1–11.5 normal during the aforesaid steps to inhibit the decomposition of the dissolved trivalent material and the oxidation of the nitric oxide past the trivalent state, thereby maximizing the separation of the nitric oxide from the admixture.

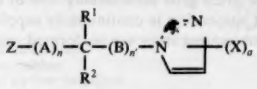
4,118,461

1-SUBSTITUTED ARALKYL IMIDAZOLES

George A. Miller, Maple Glen, and Hak-Foon Chan, Doylestown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 642,041, Dec. 8, 1975, which is a continuation-in-part of Ser. No. 547,291, Feb. 5, 1975, abandoned. This application Nov. 12, 1976, Ser. No. 741,441
Int. Cl.[2] A61K *31/415*; C07D *233/58*
U.S. Cl. 424—273 R 5 Claims

1. A compound of the formula



wherein Z is [(C_6-C_{14})aryl or (C_6-C_{14})aryl] phenyl, naphthyl, biphenyl, acenaphthenyl, indanyl, furyl or thienyl or phenyl substituted with up to three substituents selected from the group consisting of chloro, fluoro, bromo, iodo, methyl, ethyl, methoxy, ethoxy, nitro, amino, methylthio and trihalomethyl; R^1 and R^2 taken together with the carbon atom to which they are attached form (C_3–C_8) cycloalkyl; A and B are divalent (C_1–C_5)alkylene groups; X is (C_1–C_4) alkyl, halogen or nitro; *a* is 0 to 3; *n* is 0 or 1; *n'* is 0 or 1; and *n* plus *n'* is 1 or 2 and the agronomically acceptable acid addition salts thereof.

2. A method for controlling phytopathogenic fungi which comprises applying to a plant, to plant seeds or to the plant habitat on effective amount of a compound of claim 1.

4,118,462

PROCESS FOR THE PREPARATION OF PURIFIED PHOSPHORIC SOLUTIONS FROM PHOSPHORIC ACID

Pierre Desire, Les Roches de Condrieu, and Jacques Helgorsky, Frepillon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 549,470, Feb. 13, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,626
Claims priority, application France, Feb. 1, 1974, 74 03399
Int. Cl.[2] C01B *25/16, 15/16, 25/26*
U.S. Cl. 423—321 S 15 Claims

1. A process for the preparation of pure phosphoric acid solutions from impure wet process phosphoric acid with a recovery of at least 95% of the phosphoric acid containing a small amount of sulphuric acid comprising the steps of subjecting the impure phosphoric acid containing water and sulphuric acid to liquid-liquid contact with a substantially water immiscible aliphatic C_4–C_8 alcohol which extracts most of the phosphoric acid and some of the sulphuric acid and separates from the aqueous phase as a solvent phase, separating the organic solvent phase from the aqueous phase, subjecting the separated organic solvent phase to liquid-liquid contact with an aqueous solution containing phosphate ions and calcium ions to precipitate out $SO_4^=$ as calcium sulphate, subjecting the organic solvent phase which still contains the phosphoric acid in solution to liquid-liquid contact with an aqueous phase whereby the purified phosphoric acid transfers from the organic solvent phase to the aqueous phase, and separating the aqueous phase containing the purified phosphoric acid from the organic solvent phase.

4,118,463

PREPARATION OF HIGHLY ALKALINE SILICATES

Frank J. Mazet, Media, Pa.; D. John Meador, Utica, and Richard G. Webster, Peiu, both of Ill., assignors to PQ Corporation, Valley Forge, Pa.

Filed Jun. 7, 1977, Ser. No. 804,485
Int. Cl.[2] C01B *33/32*
U.S. Cl. 423—334 9 Claims

1. A process for producing highly alkaline alkali metal silicate having 0.75 to 1.5 moles of SiO_2 per mole of M_2O wherein M stands for sodium or potassium said process comprising the steps of:

(a) forming a bed of said alkali metal silicate within the bed area of an open hearth furnace, said bed being equipped with bubbling means positioned around the periphery of the bed area extending a distance above the floor of said furnace, sufficient amounts of said alkali metal silicate being used so that the level of the silicate is within 2 inches of the level of the bubbling means;

(b) raising the temperature within the furnace to 2000° F. or higher;

(c) supplying a gas under pressure to said bubbling means thereby activating them;

(d) charging raw materials in the proper proportion to the central portion of said furnace bed through an insulated chute, said raw materials consisting of a source of silica and a source of alkali metal;

(e) maintaining the temperature within the furnace at 2000° F. or higher thereby melting the raw materials and forming a molten pool upon the silicate bed with gas bubbles eminating from said activated bubbling means breaking the surface;

(f) continuing to charge the said raw materials to the central part of the furnace through said insulated chute, said raw materials floating on said pool of molten silicate until they melt and react, said unmelted raw materials being confined to the central portion of the furnace bed by said gas bubbles breaking the surface of the molten silicate; and

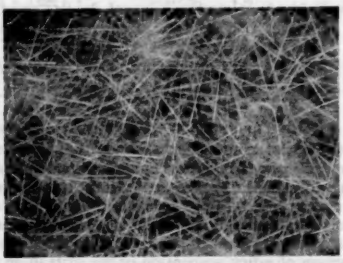
(g) drawing the molten silicate from the furnace to recover the product.

4,118,464

PROCESS FOR SEPARATING SILICA FROM SILICATE-BEARING MATERIALS

Ivan B. Cutler, Centerville, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Feb. 7, 1977, Ser. No. 766,157
Int. Cl.[2] C01B *31/36*
U.S. Cl. 423—346 11 Claims



1. A process for treating a silicate-bearing material to remove therefrom at least a portion of the silicon comprising the steps of:

obtaining a quantity of silicate-bearing material;

analyzing the silicate-bearing material to determine the silica content of the silicate-bearing material as a basis for calculating the amount of carbon necessary to reduce at least a portion of the silica to silicon monoxide without forming silicon carbide;

admixing a predetermined first quantity of carbon with the silicate-bearing material to form a first solid phase, the first carbon being present in the first solid phase in an amount sufficient to reduce at least said portion of silica to silicon monoxide, said first carbon being less than a stoichiometric amount to form silicon carbide upon reaction between the first carbon and said portion of the silica in the silicate-bearing material as indicated by the analyzing step;

dispersing the first solid phase in a second solid phase com-

prising a second carbon by pelletizing the first solid phase thereby forming a solids reaction mixture;

heating the solids reaction mixture under a nonreactive atmosphere to a temperature above about 1200° C thereby reducing said portion of the silica to silicon monoxide with the first carbon in the first solid phase;

diffusing the silicon monoxide as a gaseous phase from the first solid phase into the second solid phase; and

reacting the gaseous silicon monoxide with the second carbon in the second solid phase to form silicon carbide, the silicon carbide thereby becoming part of the second solid phase.

4,118,465

PROCESS FOR THE PREPARATION OF SODIUM PERCARBONATE AS REGULAR RHOMBOHEDRAL CRYSTALS

Jean Maiafosse, Sassenage, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Mar. 23, 1977, Ser. No. 780,347

Claims priority, application France, Mar. 29, 1976, 76 08989

Int. Cl.[2] C01B *15/10*

U.S. Cl. 423—415 P **15 Claims**

2. A process for the preparation of the sodium percarbonate in the form of regular rhombohedral crystals by reaction of concentrated hydrogen peroxide and a suspension of sodium carbonte decahydrate at least partly in the rhombohedral form, comprising

preparing the decahydrate suspension by dissolving solid anhydrous carbonate in residual liquor obtained from an earlier batch crystallization of the percarbonate and bringing the decahydrate suspension to a temperature of at least 37° C. by utilizing the dissolution heat of the anhydrous carbonate,

cooling the decahydrate suspension and initiating the crystallization of the decahydrated carbonate at a temperature lower than or equal to 32° C., said decahydrate suspension further comprising sulfate ion $SO_4^=$ and a crystallization modifier polymer having a large number of carboxyl groups selected from the group consisting of polycarboxylic polymers and copolymers of maleic anhydride, maleic acid and fumaric acid, adding the hydrogen peroxide and lowering the temperature down to a level such that the solid phase present represents from 15 to 40% of the two-phase mixture.

4,118,466

PROCESS FOR THE PRODUCTION OF COMPACT, COARSE SODIUM PERCARBONATE

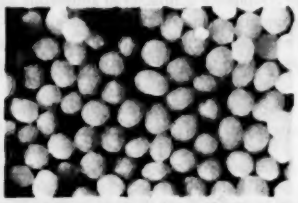
Hans Klebe, Rheinfelden; Gerd Knippschild, Wehr, and Hubert Schuster, Karsau-Beuggen, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Sep. 27, 1977, Ser. No. 837,220

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644147

Int. Cl.[2] C01B *15/10*

U.S. Cl. 423—415 P **8 Claims**



1. A process for preparing compact, coarse abrasion resistant sodium percarbonate comprising employing a solution saturated in sodium percarbonate and also containing (1) sufficient sodium carbonate that there is present sodium carbonate decahydrate as a solid phase, (2) sodium chloride in an amount of 100 to 200 grams per liter, (3) an active oxygen stabilizer and (4) sodium hexametaphosphate in an amount of 0.1 to 1.9 grams per liter, adding hydrogen peroxide in an amount about equivalent to the sodium carbonate to thereby form a solution supersaturated in sodium percarbonate, breaking down the supersaturation during the addition of the hydrogen peroxide and for a period of time up to 60 minutes thereafter, the entire process being carried out at a substantially constant temperature between 10° and 20° C and thereafter separating the sodium percarbonate precipitated from the supersaturated solution and drying the separated sodium percarbonate.

4,118,467

TREATMENT OF GAS CONTAINING HYDROGEN SULFIDE

Masaru Sano, Tokyo, and Koji Kashima, Yokohama, both of Japan, assignors to Nittetu Chemical Engineering Ltd. and Toa Oil Co., Ltd., both of Tokyo, Japan

Filed Mar. 16, 1978, Ser. No. 887,364

Claims priority, application Japan, Mar. 24, 1977, 52-31498

Int. Cl.[2] C01B *17/04*

U.S. Cl. 423—573 R **7 Claims**

1. In a process for treating a hydrogen sulfide-containing gas, in which said gas is washed with an alkali wash solution to absorb said hydrogen sulfide as hydrosulfide, the solution containing hydrosulfide being oxidized using an oxidizer-anthraquinone disulfonate system to convert said hydrosulfide into elemental sulfur, said elemental sulfur being removed therefrom to obtain a salt solution comprising sulfur compounds and the disulfonate, the improvement comprising:

a first stage wherein at least a portion of said salt solution is concentrated so as to form a concentrate having a sodium ion concentration of at least about 9 g.mol/Kg H_2O, the disulfonate being allowed to precipitate from said concentrate at a temperature of about 25° to 90° C. to form a first mixture, said first mixture being separated into a first solids rich phase containing said precipitated disulfonate and a first mother liquid phase; and

a second stage wherein said first liquid phase is cooled to a temperature not higher than 10° C. to allow the sulfur compounds to precipitate to form a second mixture, said second mixture being separated into a second solids rich phase containing said precipitated sulfur compounds and a second liquid phase.

4,118,468

TECHNETIUM-99M-LABELLED DIAGNOSTIC AGENT FOR KIDNEY SCANNING AND PROCESS FOR ITS MANUFACTURE

Helmut Strecker, Seeheim; Reinhard Käsmarker, Hofheim, and Gerhard Kloss, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 12, 1976, Ser. No. 741,397

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1975, 2551480

Int. Cl.[2] A61K *29/00, 43/00*

U.S. Cl. 424—1 **10 Claims**

1. A method for making a diagnostic agent for visualization of the kidneys, which method comprises mixing a buffer solution of pyrrolidinomethyl-tetracycline, said solution having an initial pH between 5.0 and 6.5, with a tin (II)-salt in a molar ratio of 10 to 100 mols of pyrrolidinomethyl-tetracycline per gram atom of tin (II) to give a first mixture, and then combining said first mixture with technetium-99m pertechnate in physiological sodium chloride solution to yield a second mixture having a final pH from 4 to 8.

4,118,469

ANTIGEN FOR TRACHOMA LYMPHOGRANULOMA VENEREUM (LGV) AND NON-GONOCOCCAL URETHRITIS (NGU)

Harlan D. Caldwell; Cho-Chou Kuo, and George E. Kenny, all of Seattle, Wash., assignors to Research Corporation, New York, N.Y.

Filed Apr. 27, 1976, Ser. No. 680,927
Int. Cl.[2] G01N *33/16;* A61K *43/00*
U.S. Cl. 424—1 18 Claims

1. *Chlamydia trachomatis* specific antigen useful for the serological diagnosis of lymphogranuloma venereum, said antigen having a molecular weight of about 160,000, being stable to ribonuclease and deoxyribonuclease and at a pH in the range 2.2–10.6 but whose antigenicity is destroyed by protease treatment and heating at a temperature of 56° C. for about 30 minutes.

4,118,470

NORMALLY-SOLID, BIOABSORBABLE, HYDROLYZABLE, POLYMERIC REACTION PRODUCT

Donald James Casey, Ridgefield, and Martin Epstein, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 691,749, Jun. 1, 1976, Pat. No. 4,048,256. This application May 5, 1977, Ser. No. 793,986
Int. Cl.[2] A61L *15/03, 17/00;* A61K *31/74*
U.S. Cl. 424—19 2 Claims

1. A device for the controlled continuous administration of a predetermined dosage of a drug to a living animal comprising the polymeric reaction product of (A) a polyglycolic acid composition and (B) a polyester of diglycolic acid and an unhindered glycol; wherein the amount of (B) used is between about 2% and 50%, by weight, based on the total weight of (A) and (B); wherein (A), before reaction with (B), has a molecular weight of at least 30,000 and (B), before reaction with (A), has a molecular weight sufficiently high so as to provide a polymeric material possessing self-supporting film-forming properties, which has dispersed uniformly throughout said polymeric reaction product, a drug formulation.

4,118,471

STABLE DENTIFRICE

Philip Pensak, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jun. 9, 1977, Ser. No. 804,958
Int. Cl.[2] A61K *7/18;* B65D *81/24, 81/26, 85/14*
U.S. Cl. 424—52 5 Claims

1. A packaged dentifrice comprising an aluminum tube having no inner lining on the aluminum surface and a dentifrice in said tube comprising an aqueous liquid and solids proportioned to an extrudible creamy mass and dispersed therein a polishing agent of alpha-alumina trihydrate, a fluorine-containing compound in amount to provide about 0.01–1% by weight of fluorine-containing ions and an acidifying agent consisting essentially of saccharin acid, wherein said dentifrice has a pH of about 6.5–8.0.

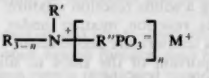
4,118,472

ANTIBACTERIAL ORAL COMPOSITION

Abdul Gaffar, Somerset, and Hollandra P. Niles, Newark, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,714
Int. Cl.[2] A61K *7/22, 7/16*
U.S. Cl. 424—54 15 Claims

1. An oral composition comprising an oral vehicle, at least one nitrogen containing antibacterial antiplaque agent selected from the group consisting of cationic bis-guanido and quaternary ammonium antibacterial antiplaque agents and a water soluble quaternary aminoalkylene phosphonic compound of the formula:



wherein R is alkyl, alkenyl, cycloalkyl, or aralkyl, each of up to 20 carbon atoms; R^1 is alkyl or alkenyl, each of up to 20 carbon atoms; R^{11} is alkylene or alkenylene each of up to 6 carbon atoms; n is an interger from 1 to 3; and M is an orally acceptable cation.

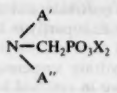
4,118,473

ANTIBACTERIAL ORAL COMPOSITION

Abdul Gaffar, Somerset, and Hollandra P. Niles, Newark, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,716
Int. Cl.[2] A61K *7/22, 7/16*
U.S. Cl. 424—54 15 Claims

1. An oral composition comprising an oral vehicle, at least one nitrogen containing antibacterial antiplaque agent selected from the group consisting of cationic bis-guanido and quaternary ammonium antibacterial antiplaque agents and a water soluble N-methylene phosphonate compound of the formula:



wherein A′ is $-CH_2CH_2OH$, $-CH_2COOX$ or $-CH_2PO_3X_2$; A″ is $-CH_2CH_2OH$ or $-CH_2COOX$; A′ equals A″ when A′ is not $-CH_2PO_3X_2$; and X is an orally acceptable cation.

4,118,474

ANTIBACTERIAL ORAL COMPOSITION

Abdul Gaffar, Somerset, and Hollandra P. Niles, Newark, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,717
Int. Cl.[2] A61K *7/22, 7/16*
U.S. Cl. 424—54 14 Claims

1. An oral composition comprising an oral vehicle, at least one nitrogen containing antibacterial antiplaque agent selected from the group consisting of cationic bis-guanido and quaternary ammonium antibacterial antiplaque agents and phosphonoacetic acid or an orally acceptable salt thereof.

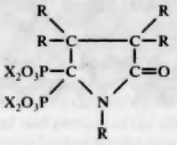
4,118,475

ANTIBACTERIAL ORAL COMPOSITION

Abdul Gaffar, Somerset, and Hollandra P. Niles, Newark, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,715
Int. Cl.[2] A61K *7/22, 7/16*
U.S. Cl. 424—54 15 Claims

1. An oral composition comprising an oral vehicle, at least one nitrogen containing antibacterial antiplaque agent selected from the group consisting of cationic bis-guanido and quaternary ammonium antibacterial antiplaque agents and a water soluble diphosphono pyrrolidone compound of the formula:



wherein the R's are independently hydrogen, C_1 to C_6 alkyl or C_2 to C_6 hydroxyalkyl, and X is an orally acceptable cation.

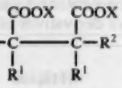
4,118,476

ANTIBACTERIAL ORAL COMPOSITION

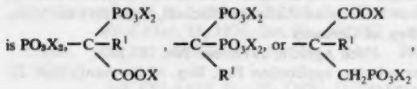
Abdul Gaffar, Somerset, and Hollandra P. Niles, Newark, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,719
Int. Cl.[2] A61K *7/22, 7/16*
U.S. Cl. 424—54 **15 Claims**

1. An oral composition comprising an oral vehicle, at least one nitrogen containing antibacterial antiplaque agent selected from the group consisting of cationic bis-guanido and quaternary ammonium antibacterial antiplaque agents and at least one water soluble phosphoncarboxylate compound of the formula:



wherein R^1 is hydrogen, C_1 to C_4 alkyl or $(CH_2)_{1-2}COOX$; and R^2



and X is an orally acceptable cation.

4,118,477

HEPATITIS B ANTIGEN

William J. McAleer, Ambler, and Edward H. Wasmuth, Telford, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 768,236, Feb. 14, 1977, abandoned, which is a division of Ser. No. 587,707, Jun. 16, 1975, Pat. No. 4,024,243. This application Sep. 2, 1977, Ser. No. 830,291
Int. Cl.[2] A61K *39/12*
U.S. Cl. 424—89 **5 Claims**

1. A process for multiple loading a density gradient comprising subjecting human biological fluid containing HB_sAg to partial isopycnic banding in a density gradient under conditions effective to pass substantially all of the HB_sAg from the fluid into the density gradient but ineffective to achieve equilibrium, removing the spent fluid and repeating the first step with a fresh sample of fluid at least once.

4,118,478

VACCINE MANUFACTURE FOR ACTIVE IMMUNIZATION CONTAINING HEPATITIS B SURFACE ANTIGEN AND ASSOCIATED ANTIGEN

Alfred M. Prince, Stamford, Conn.; John Vnek, Bronx; Robert A. Neurath, New York, both of N.Y., and Christian Trepo, Bron, France, assignors to The New York Blood Center, Inc., New York, N.Y.

Division of Ser. No. 631,961, Nov. 17, 1975. This application Feb. 24, 1977, Ser. No. 771,728
Claims priority, application France, Mar. 14, 1975, 75 08046
Int. Cl.[2] A61K *39/12;* **C12K** *7/00*
U.S. Cl. 424—89 **3 Claims**

1. A method of manufacturing a vaccine against hepatitis which comprises:

A. Obtaining the blood serum of a chronic carrier of hepatitis BsAg which blood serum contains HBsAg associated particles of a size of 16 to 50 nm of which at least some are in the range of 30–50 nm and is substantially free of anti-HBs and contains e-antigen and abundant Dane particles and which has no dectectable anti-e antibody, at least 1 percent of said particles being characterized by the presence of free, uncombined and unprecipitated e-antigen;

B. Removing other proteinaceous matter from said serum such that the serum contains less that 10% of proteinaceous matter other than that associated with HBsAg or e-antigen;

C. Inactivating any virus in the serum; and

D. Diluting the antigen containing serum with a physiologically acceptable medium.

4,118,479

VACCINE FOR ACTIVE IMMUNIZATION CONTAINING HEPATITIS B SURFACE ANTIGEN AND ASSOCIATED ANTIGEN

Alfred M. Prince, Stamford, Conn.; John Vnek, Bronx; Robert A. Neurath, New York, both of N.Y., and Christian Trepo, Bron, France, assignors to The New York Blood Center, Inc., New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 631,961
Claims priority, application France, Mar. 14, 1975, 75 08046
Int. Cl.[2] A61K *39/12*
U.S. Cl. 424—89 **15 Claims**

1. An antigenic composition against viral hepatitis comprising:

A. Antigenic particles having a particle size in the range of 30 to 50 nm, said antigenic particles containing unprecipitated free hepatitis B surface antigens,

B. Said antigenic composition having less than 10 units of antibodies of heptatitis B surface antigens per 1,000 units of heptatitis B surface antigen,

C. At least 5% of the particles of said antigenic composition in the size range of 30 to 50 nm containing unprecipitated e-antigen,

D. Said HBsAg and said e-antigen being present in said antigenic composition in an amount sufficient to produce antibodies when introduced into a host animal, the balance being a medium which is physiologically acceptable.

4,118,480

PHARMACEUTICAL PREPARATION FOR TREATING HEMORRHOIDS AND ANAL FISSURES

Glenn L. Williams, Lafayette Hill, Pa., assignor to Charles V. Stoelker, Philadelphia, Pa.

Continuation-in-part of Ser. No. 331,081, Feb. 9, 1973, abandoned. This application Aug. 9, 1974, Ser. No. 496,276
Int. Cl.[2] A61K *33/24, 31/47, 31/245, 31/05*
U.S. Cl. 424—131 **2 Claims**

1. A pharmaceutical preparation of treating hemorrhoids and anal fissures, comprising as ingredients in the proportions by weight of about 1.4 to 0.36 parts phenol, 0.7 to 0.18 parts menthol, 10 parts bismuth subnitrate, 10 parts pulverized starch, and 50 parts of 1% dibucaine or 20% benzocaine in an ointment base, the ratio of phenol to menthol being about 2 to 1, said menthol being sufficient in amount to neutralize the unwanted astringent properties of the phenol and less than the amount to cause crystallization of the menthol, the ingredients include and are in the proportions by weight of 0.6 gr phenol, 0.3 gr menthol, 10 gr bismuth subnitrate, 10 gr pulverized starch, and 50 gr of 1% by weight of dibucaine in an ointment base of lanolin and petrolatum.

4,118,481

DEAMINO DERIVATIVES OF THE KALLIKREIN-TRYPSIN INHIBITOR

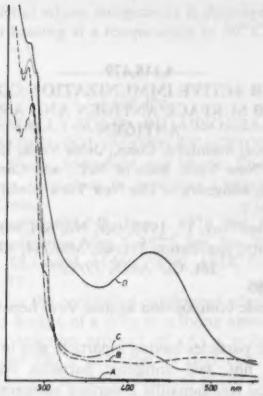
Eugen Schnabel; Horst Dieter Schlumberger; Gerd Reinhardt; Ernst Truscheit, all of Wuppertal, and Harald Tschesche, Groebenzell, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 29, 1977, Ser. No. 792,296

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619246

Int. Cl.[2] A61K *37/00;* **C07C** *103/52;* **C07G** *7/00*

U.S. Cl. 424—177 **14 Claims**



9. A pharmaceutical composition useful in the treatment of diseases caused by overproduction of proteases, comprising a therapeutically or prophylactically effective amount of the deamino kallikrein-trypsin inhibitor obtained from cattle organs having elastace inhibition activity, characterized by

(a) 0 to 3 lysine residues and/or 3 to 6 arginine residues and/or 1 to 4 tyrosine residues; and

(b) the 10- and/or 21-tyrosine residues being unsubstituted or substituted by at least one nitro, nitroso or amino in the ortho position relative to the phenolic hydroxy group, in combination with a pharmaceutically acceptable solid or liquid inert carrier or diluent therefor.

12. A method of treating diseases caused by overproduction of proteases, which comprises administering to the host in need thereof a therapeutically or prophylactically effective amount of the deamino kallikrein-trypsin inhibitor obtained from cattle organs having elastace inhibition activity, characterized by

(a) 0 to 3 lysine residues and/or 3 to 6 arginine residues and/or 1 to 4 tyrosine residues; and

(b) the 10- and/or 21-tyrosine residues being unsubstituted or substituted by at least one nitro, nitroso or amino in the ortho position relative to the phenolic hydroxy group.

4,118,482

PROCESS FOR TREATING NEOPLASTIC DISEASE WITH AZETOMICINS

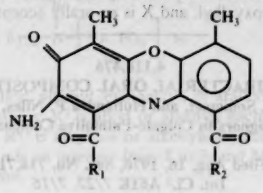
Martin A. Apple, Daly City, Calif., and Joseph V. Formica, Richmond, Va., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 605,425, Aug. 18, 1975, Pat. No. 4,053,460. This application Jul. 22, 1977, Ser. No. 818,062

Int. Cl.[2] A61K *37/02;* **C07C** *103/52*

U.S. Cl. 424—177 **4 Claims**

1. A method for treating neoplastic disease in mammals comprising administering to a host subject an effective amount of a compound having the formula:



wherein R_1 and R_2 are five membered peptide lactones with the first peptide member counting from the multiple-ringed structure derived from threonine and the fifth peptide member derived from methyl-valine or methyl-isoleucine and with the lactone linkage extending from the first to the fifth member of each said peptide and wherein the third member of at least one of said peptides is selected from the group consisting of an azetidine-2-carbonyl moiety, and pharmacologically suitable and biologically active derivatives of said compound.

4,118,483

PEPTIDES HAVING GONADOLIBERIN ACTIVITY AND PROCESS FOR THEIR MANUFACTURE

Wolfgang König, Hofheim, Rolf Geiger, Frankfurt am Main, and Jürgen Sandow, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 20, 1977, Ser. No. 789,253

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1976, 2617646

Int. Cl.[2] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **6 Claims**

1.

Glu-His-Trp-Ser-Tyr-D-GLin(X)-Leu-Arg-Pro-NH—C_2H_5,

wherein X is cyclohexyl, adamantyl, or 4,4'-dimethoxybenzhydryl.

4,118,484

METHOD OF TREATING RHEUMATOID ARTHRITIS

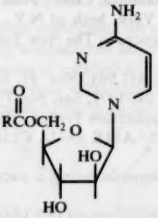
William J. Wechter, Kalamazoo, and Carter D. Brooks, Texas Township, Kalamazoo County, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 29, 1976, Ser. No. 671,289

Int. Cl.[2] A61K *31/70;* **C07H** *19/08*

U.S. Cl. 424—180 **30 Claims**

1. A method of controlling the inflammatory process in a rheumatoid joint of a mammal which comprises the intra-articular administration to said joint of an effective amount for controlling the inflammatory process of a 5'-O-acyl-ara-cytidine, characterized by having the formula:



wherein R is a radical selected from the group consisting of a straight or branched chain aliphatic radical of from 1 through 20 carbon atoms, an aromatic radical of from 6 through 10 carbon atoms, a monocyclic aliphatic radical of from 4 through

10 carbon atoms, an araliphatic radical of from 7 through 12 carbon atoms, a cage-type hydrocarbon radical containing from 7 through 20 carbon atoms, and including such radicals substituted by halogen, hydroxyl, carboxyl, nitro, alkoxy or mercapto substituent groups, and R when taken together with

is the acyl radical of an aliphatic dicarboxylic acid of from 3 through 8 carbon atom; and being further characterized by having:

(a) an enzymatic hydrolysis rate in human rheumatoid synovial fluid equal to or greater than the enzymatic hydrolysis rate of 5'-O-1-adamantoyl-ara-cytidine, and

(b) an aqueous solubility of less than about 300 μg./ml; or a pharmaceutically acceptable acid addition salt thereof.

4,118,485

NON-THROMBOGENIC MEDICAL ARTICLE AND A METHOD FOR ITS PREPARATION

Jan-Christer Eriksson, Djursholm; Rolf Larsson, Ekero; Åke Rosengren, Enskede, and Maj-Britt Hjelte, Huddinge, all of Sweden, assignors to Aminkemi Aktiebolag, Broma, Sweden

Filed Mar. 15, 1976, Ser. No. 666,943

Claims priority, application Sweden, Mar. 20, 1975, 75/032409

Int. Cl.[2] A61K *31/725;* **C07G** *11/00*

U.S. Cl. 424—183 **25 Claims**

1. A medical article for use in contact with blood having a surface coating containing heparin to prevent thrombosis upon contact with blood, said surface coating also containing Schiff's bases with low solubility formed by the reaction of a dialdehyde and a primary amine, the molecules of said Schiff's bases being interspersed between the heparin molecules having partially blocked anionic groups in said surface coating to prevent substantial release of heparin from said surface coating upon contact with blood.

4,118,486

COMBATING ARTHROPODS WITH O-METHYL-O-N-PROPYL-O-(2-CARBALKOXY-2-ALKOXY-VINYL)-THIONOPHOSPHORIC ACID ESTERS

Fritz Maurer; Hans-Jochem Riebel, both of Wuppertal; Wolfgang Behrenz, Untergruendemich, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

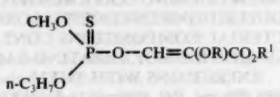
Filed Jul. 28, 1977, Ser. No. 820,061

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1976, 2637008

Int. Cl.[2] A01N *9/36;* **C07F** *9/165*

U.S. Cl. 424—212 **9 Claims**

1. An O-methyl-O-n-propyl-O-(2-carbalkoxy-2-alkoxy-vinyl)-thionophosphoric acid ester of the formula



in which

R and R^1 each independently is alkyl with 1 to 6 carbon atoms.

2. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

4,118,487

SUBSTITUTED AZOL-1-YLMETHANES

Erik Regel; Wilfried Draber; Karl Heinz Büchel, and Manfred Plempel, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

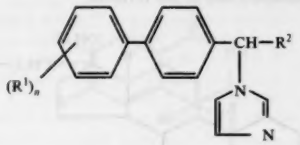
Filed Dec. 5, 1975, Ser. No. 638,274

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1974, 2461406

Int. Cl.[2] A61K *31/41;* **C07D** *233/56, 233/58, 233/60*

U.S. Cl. 424—232 **53 Claims**

1. A compound selected from the group consisting of an imidazole of the formula:



and the pharmaceutically acceptable nontoxic salts thereof, wherein

R^1 is hydrogen, halo, lower alkyl; lower alkoxy, halo(lower alkyl); or phenyl(lower alkyl);

R^2 is lower alkyl, phenyl or phenyl substituted with one or two substituents independently selected from the group consisting of lower alkyl, halo and halo(lower alkyl); and

n is 1, 2 or 3.

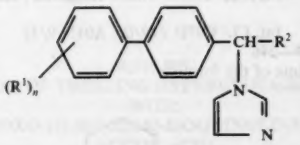
19. The compound according to claim 1 wherein

R^1 is hydrogen;

n is 1; and

R^2 is 2,5-dichlorophenyl.

37. A method of treating mycoses and bacterial infections in humans and animals which comprises administering to a human or animal in need thereof an effective amount of a pharmaceutical composition which comprises an antimycotically effective amount or an antibacterially effective amount of a compound selected from the group consisting of an imidazole of the formula:



and the pharmaceutically acceptable, nontoxic salts thereof, wherein

R^1 is hydrogen; halo; lower alkyl; lower alkoxy; halo(lower alkyl); or phenyl(lower alkyl);

R^2 is lower alkyl; phenyl; or phenyl substituted by one or two substituents independently selected from the group consisting of lower alkyl, halo, and halo(lower alkyl);

n has a value of from 1 to 3,

in combination with a pharmaceutically acceptable, nontoxic, inert diluent or carrier.

4,118,488

4-ANDROSTEN-3-ONES AND PROCESS FOR THE PREPARATION THEREOF

Rainer Philippson, Bergkamen; Bernhard Krieger, Unna; Jorge Casals-Stenzel, Berlin; Ulrich Kerb, Berlin; Wolfgang Losert, Berlin; Klaus Prezewowsky, Berlin; Rudolf Wiechert, Berlin, and Dieter Bittler, Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin, Fed. Rep. of Germany

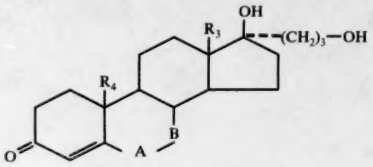
Filed Mar. 3, 1977, Ser. No. 773,982

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609694; Mar. 5, 1976, 2609695; Jun. 16, 1976, 2627187; Jun. 16, 1976, 2627186; Sep. 30, 1976, 2644427; Oct. 8, 1976, 2646043

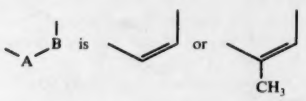
Int. Cl.[2] C07J *9/00;* **A61K** *31/56*

U.S. Cl. 424—238 **74 Claims**

60. A pharmaceutical composition comprising, in unit dosage form, and in admixture with a pharmaceutically acceptable carrier, a diuretically effective amount per unit dosage of a 4,6-androstadiene-3-one of the formula



wherein R_3 is methyl or ethyl, R_4 is hydrogen or methyl,



or a physiologically acceptable (a) 17β-hydroxy mono ester thereof, or (b) 17α-(3-hydroxypropyl) mono ester thereof or mono ether thereof, (c) 17β-hydroxy mono ester, 17α-(3-hydroxypropyl) mono ether thereof, or (d) 17β-hydroxy-17α-(3-hydroxypropyl) diester thereof.

4,118,489

INSECTICIDAL 2-(1-(HALOBENZOYL)-1-HYDROXYIMINOMETHYL)-5,6-DIHYDRO-4H-1,3-THIAZINES

Martin Anderson, Whitstable, and Antony G. Brinnand, Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

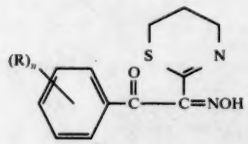
Continuation-in-part of Ser. No. 779,646, Mar. 21, 1977, abandoned. This application Dec. 2, 1977, Ser. No. 856,701

Claims priority, application United Kingdom, Mar. 30, 1976, 12745/76

Int. Cl.[2] C07D *279/06;* **A01N** *9/12*

U.S. Cl. 424—246 **3 Claims**

1. An oxime of the formula:



(I)

wherein n is 1, 2 or 3, and R is chlorine or bromine, with the provisos that, relative to the carbon atom of the phenyl ring that is bonded to the carbonyl moiety, when $n = 1$, the moiety, R, is bonded at a carbon atom at the 3- or 4- position in the ring; when $n = 2$, the moieties, R, are bonded at the carbon atoms at the 2- and 4- or the 3- and 4- positions in the ring; when $n = 3$, the moieties, R, are bonded at the carbon atoms at the 2-, 3- and 4- positions in the ring.

2. A method for killing insects of the genus *Spodoptera,* which comprises contacting said insects with an effective amount of a compound of claim **1**.

4,118,490

7-ACYL-3-(SULFONIC ACID AND SULFAMOYL SUBSTITUTED TETRAZOLYL THIOMETHYL)CEPHALOSPORINS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

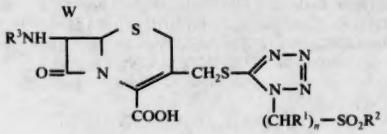
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 687,792, May 19, 1976, Pat. No. 4,048,311, which is a continuation-in-part of Ser. No. 647,394, Jan. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 559,609, Mar. 18, 1975, abandoned. This application May 11, 1977, Ser. No. 796,052

Int. Cl.[2] A61K *31/545;* **C07D** *501/50, 257/04*

U.S. Cl. 424—246 **34 Claims**

1. A compound of the formula:



in which:

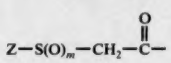
W is hydrogen or methoxy;

each individual R^1 is hydrogen or lower alkyl;

n is 1 to 10;

R^2 is hydroxy, amino, lower alkylamino or di(lower)alkylamino; and

R^3 is an acyl group of the formula:



where:

Z is methyl, trifluoromethyl, trifluoroethyl, cyanomethyl or pyridyl; and

m is 0 to 2, or a non-toxic pharmaceutically acceptable salt.

17. An antibacterial pharmaceutical composition comprising a compound as claimed in claim **1** and a pharmaceutically acceptable carrier therefor.

27. A method of treating bacterial infections comprising administering internally by injection to an infected or susceptible warm-blooded animal an anti-bacterially effective but non-toxic dose of a compound as claimed in claim **1**.

4,118,491

7-ACYL-3-(SULFAMINOALKYL SUBSTITUTED TETRAZOLYLTHIOMETHYL)CEPHALOSPORINS, ANTIBACTERIAL COMPOSITIONS CONTAINING THEM AND METHODS OF TREATING BACTERIAL INFECTIONS WITH THEM

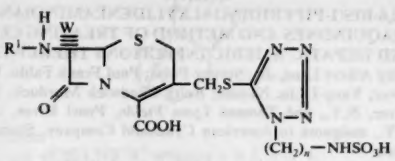
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 665,837, Mar. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,164, Oct. 30, 1975, abandoned. This application Jul. 12, 1976, Ser. No. 704,142

Int. Cl.[2] A61K *31/545;* **C07D** *501/54, 501/56*

U.S. Cl. 424—246 **22 Claims**

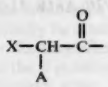
1. A compound of the formula:



in which:

W is hydrogen or methoxy;

R^1 is an acyl group of the formula:



where:

X is thienyl, dihydrophenyl, phenyl or phenyl monosubstituted with hydroxy, hydroxymethyl, formamido, ureido or carboxymethylamino;

A is NH_2, OH, COOH or SO_3H; or formyloxy when X is phenyl; and

n is two to five, or a non-toxic pharmaceutically acceptable salt thereof.

12. An antibacterial pharmaceutical composition comprising a compound as claimed in claim **1** and a pharmaceutically acceptable carrier therefor.

14. A method of treating bacterial infections comprising administering internally by injection to an infected or susceptible warm-blooded animal an antibacterially effective but non-toxic dose of a compound as claimed in claim **1**.

4,118,492

DIURETIC PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE CONTAINING THE SULFURIC ACID HALF-ESTER OF 2,4,7-TRIAMINO-6P-HYDROXYPHENYL PTERIDINE

Karl-Dieter Voelger, Darmstadt; Christian Rietzel, Heidelberg, and Klaus Lehmann, Rossdorf, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Mar. 31, 1977, Ser. No. 783,386

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1976, 2614738

Int. Cl.[2] **A61K** *31/505*

U.S. Cl. 424—251 **3 Claims**

1. The method of inducing diuresis in a patient requiring the same, which method comprises orally, parenterally, or intravenously administering to said patient a diuretically effective amount of the sulfuric acid half ester of 2,4,7-triamino-6-p-hydroxyphenyl pteridine or of a physiologically tolerable salt thereof.

4,118,493

METHOD OF TREATING HYPERCHLORHYDRIA AND/OR ASSOCIATED CONDITIONS WITH 1,3-DIOXO-1H-BENZ(DE)ISOQUINOLINE-2-(3H)-ACETIC ACID

Wilbur Lippmann, Montreal, Canada, assignor to American Home Products Corporation, New York, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,378

Int. Cl.[2] **A61K** *31/47*

U.S. Cl. 424—258 **4 Claims**

1. A method for preventing the secretion of excessive amounts of hydrochloric acid in the stomach of humans, which comprises: administering to a human suffering from hyperchlorhydria an effective amount of 1,3-dioxo-1H-benz-[de]isoquinoline-2(3H)-acetic acid, or a therapeutically acceptable salt thereof.

4,118,494

SUBSTITUTED 3,4-DIHYDRO-2H-ISOQUINOLIN-1-THIONES

Rudolf Kunstmann, Breckenheim, and Joachim Kaiser, Bad Soden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 649,498, Jan. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 604,011, Aug. 12, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,168

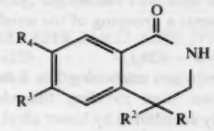
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1974, 2438966

The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.

Int. Cl.[2] **A61K** *31/47;* **C07D** *217/24*

U.S. Cl. 424—258 **5 Claims**

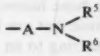
1. A 3,4-dihydroisoquinoline of the formula



or a pharmaceutically acceptable salt thereof, wherein

R^1 is methyl, ethyl, or phenyl;

R^2 is



wherein A is straight-chain or branched alkylene having 2 or 3 carbon atoms and R^5 and R^6 are the same alkyl having 1 to 4 carbon atoms; and

R^3 and R^4 are the same or different and are hydrogen or lower alkoxy having 1 to 4 carbon atoms.

4. A pharmaceutical composition for treating arrhythmia which comprises a pharmaceutical carrier and an anti-arrhythmically effective amount of a compound as claimed in claim **1**.

5. The method of treating disturbances of the cardiac rhythm in a patient suffering therefrom which comprises internally administering to said patient a therapeutically effective amount of a compound as claimed in claim **1**.

4,118,495

METHOD OF TREATING HYPERGLUCAGONEMIA WITH 1,3-DIOXO-1H-BENZ[DE]-ISOQUINOLINE-2(3H)-ACETIC ACID

Wilbur Lippmann, Montreal, Canada, assignor to Ayerst, McKenna & Harrison Limited, Montreal, Canada

Filed Jul. 25, 1977, Ser. No. 818,379

Int. Cl.[2] **A61K** *31/47*

U.S. Cl. 424—258 **4 Claims**

1. A method for preventing or decreasing the secretion or availability of excessive amounts of glucagon in humans, which comprises: administering to a human suffering from hyperglucagonemia an effective amount of 1,3-dioxo-1H-benz-[de]isoquinoline-2(3H)-acetic acid, or a therapeutically acceptable salt thereof.

4,118,496

HETEROCYCLIC-METHYLTHIOALKYL-AMIDINES

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, and Rodney Christopher Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

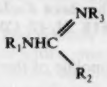
Division of Ser. No. 551,220, Feb. 19, 1975, Pat. No. 4,036,971. This application May 5, 1977, Ser. No. 794,177

Claims priority, application United Kingdom, Mar. 12, 1974, 10869/74

Int. Cl.[2] A61K *31/44;* **C07D** *213/58*

U.S. Cl. 424—263 **7 Claims**

1. A compound of the formula:



wherein R_1 represents a grouping of the structure

$$Het - CH_2 - S - (CH_2)_n -$$

wherein Het is a nitrogen containing 5 or 6 membered heterocyclic ring selected from pyridine, thiazole or isothiazole which is optionally substituted by lower alkyl, hydroxyl, halogen or amino; n is 2 or 3; R_2 is lower alkyl or phenyl optionally substituted by hydroxy or mercapto; and R_3 is hydrogen, lower alkyl or R_1, or a pharmaceutically acceptable acid addition salt thereof.

7. A method of blocking histamine H_2-receptor, said histamine H_2-receptors being those histamine receptors which are not blocked by mepyramine but are blocked by burimamide, which comprises administering to an animal in need of blocking of said histamine H_2-receptors in an effective amount to block said histamine H_2-receptors a compound of claim **1**.

4,118,497

ANTIDEPRESSANTLY ACTIVE 5-(4-AMINOPHENYL)-HEXAHYDRO-1H-INDENO-(1,2-B)PYRIDINE

Rudolf Kunstmann, Breckenheim; Ulrich Lerch, and Hermann Gerhards, both of Hofheim, Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 16, 1976, Ser. No. 649,638

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1975, 2501930

Int. Cl.[2] C07D *221/16;* **A61K** *31/445*

U.S. Cl. 424—267 **3 Claims**

1. 4a(S,R); 5(R,S); 9b(S,R) 5-(4-aminophenyl)-2,3,4,4a,5,9b-hexahydro-1H-indeno[1,2-b]pyridine.

3. The method of treating depression in a patient suffering therefrom which comprises an anti-depressively effective amount of administering to said patient an anti-depressively effective amount of a compound as in claim **1**.

4,118,498

2,6-BIS(1-PIPERIDINOALKYLIDENEAMINO)ANTHRAQUINONES AND METHOD OF TREATING CECAL AND HEPATIC AMEBIC INFECTIONS THEREWITH

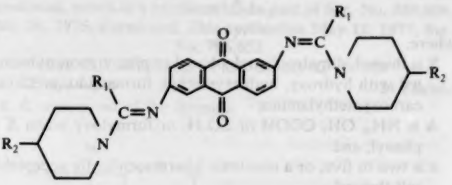
Stanley Albert Lang, Jr., Stoney Point; Paul Frank Fabio, Pearl River; Yang-I Lin, Nanuet; Keith Chadwick Murdock, Pearl River, N.Y., and Thomas Lynn Fields, Pearl River, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 772,038, Feb. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 699,816, Jun. 24, 1976, abandoned, which is a division of Ser. No. 606,805, Aug. 22, 1975, abandoned. This application Nov. 15, 1977, Ser. No. 851,662

Int. Cl.[2] C07D *21/10;* **A61K** *31/445;* **C07D** *295/12*

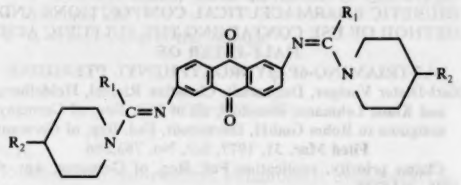
U.S. Cl. 424—267 **10 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consistng of hydrogen and lower alkyl (C_1–C_2) and R_2 is selected from the group consisting of hydrogen and lower alkyl (C_1–C_2) and pharmaceutically acceptable salts thereof.

6. A method of treating cecal and hepatic amebic infections in warm-blooded animals which comprises administering to said animals an amount effective against said infections of a compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen and lower alkyl (C_1–C_2) and R_2 is selected from the group consisting of hydrogen and lower alkyl (C_1–C_2) and pharmaceutically acceptable salts thereof.

4,118,499

ANTI-ANXIETY AND ANTI-PARKINSONIAN 1-AMINOALKYL-2-ENDO-CHLORO-7,7-DIMETHYL-NORBORNANES

Leslie Stephenson, London, and Colin Smith, New Malden, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

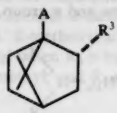
Filed Oct. 8, 1976, Ser. No. 730,980

Claims priority, application United Kingdom, Oct. 15, 1975, 42280/75; Oct. 15, 1975, 42278/75

Int. Cl.[2] A61K *31/445;* **C07D** *211/14*

U.S. Cl. 424—267 **17 Claims**

1. 7,7-Dimethyl-[2.2.1]-bicycloheptane of the formula:



I

wherein

A is $-(CH_2)_nNR^1R^2$ wherein n is 2, 3 or 4;

R^1 and R^2, which may be the same or different, are hydrogen atoms or C_{1-6} alkyl or C_{2-6} alkenyl groups or, together with the intervening nitrogen atom, represent a 4–7 membered saturated heterocylic ring which is unsubstituted or substituted by a C_{1-6} alkyl group; and

R^3 is a chlorine atom in the endo configuration; which compounds may optionally be substituted by a C_{1-4} alkyl group at any position on the alkylene chain of A, or by an oxo or hydroxy group at the β-position of the alkylene chain of A relative to the nitrogen atom;

or the physiologically acceptable acid addition salts thereof.

15. A method of treating Parkinson's disease which comprises administering to a patient or animal in need of such treatment an effective anti-Parkinsonism amount of a compound as claimed in claim **1**.

4,118,500
FUNGICIDAL ALKOXY MONO- AND DIALKOXY N-SUBSTITUTED CYCLIC AMINES

Michael Mitzlaff, Bad Homburg, Taunus; Klaus Warning, Liederbach, Taunus, and Harald Jensen, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

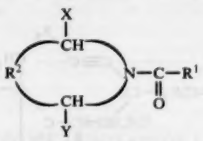
Filed Sep. 3, 1976, Ser. No. 720,384

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1975, 2539777; Dec. 22, 1975, 2557790; Jul. 29, 1976, 2634049

Int. Cl.[2] **C07D** *211/42;* **A61K** *31/445*

U.S. Cl. 424—267 **7 Claims**

1. A compound of the formula



(I)

wherein

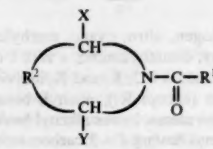
R^1 is hydrogen, an alkyl group having from 1 to 8 carbon atoms, an aryl group having from 6 to 10 carbon atoms, an alkoxy group having from 1 to 4 carbon atoms, benzyloxy or phenoxy,

R^2 is a linear or branched alkylene group having from 1 to 4 carbon atoms in the chain,

X is OR^3, where R^3 represents an alkyl group having from 1 to 4 carbon atoms,

Y is hydrogen, $(C_1–C_4)$-alkyl, $(C_1–C_4)$-O-alkoxy, provided that in the case where R^1 is an alkoxy group having from 1 to 4 carbon atoms, Y is not H.

5. A fungicidal composition comprising an inert carrier and containing as an essential active ingredient a fungicidally effective amount of a compound of the formula



wherein

R^1 is hydrogen, an alkyl group having from 1 to 8 carbon atoms, an aryl group having from 6 to 10 carbon atoms, an alkoxy group having from 1 to 4 carbon atoms, benzyloxy or phenoxy,

R^2 is a linear or branched alkylene group having from 1 to 4 carbon atoms in the chain,

X is OR^3, where R^3 represents an alkyl group having from 1 to 4 carbon atoms, and

Y is hydrogen, $(C_1–C_4)$-alkyl, or $(C_1–C_4)$-O-alkoxy, provided that in the case where R^1 is an alkoxy group having from 1 to 4 carbon atoms, Y is not H.

4,118,501
THIAZOLIDINE DERIVATIVES

Hans-Jochen Lang, Altenhain, Taunus, and Roman Muschaweck, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

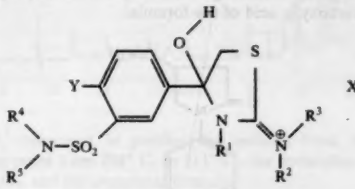
Filed Jan. 14, 1977, Ser. No. 759,546

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1976, 2601598

Int. Cl.[2] **A61K** *31/425;* **C07D** *277/14, 277/18*

U.S. Cl. 424—270 **11 Claims**

1. Thiazolidine of the formula



in which R^1 represents alkyl or alkenyl of up to 4 carbon atoms or cycloalkyl of 3 to 6 carbon atoms, R^2 and R^3 are identical or different and represent alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, alkenyl of 3 to 4 carbon atoms, phenylalkyl of 1 to 3 carbon atoms in the alkyl moiety, piperonyl or phenyl, Y represents hydrogen, bromine or chlorine, R^4 stands for hydrogen or an alkyl of 1 to 4 carbon atoms, R^5 is hydrogen, alkyl of 1 to 4 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, benzyl, hexahydrobenzyl, chlorobenzyl, methylbenzyl or phenylethyl, and X represents the anion of a pharmacologically tolerated acid.

6. A method of treatment which comprises administering to a patient in need of salidiuretic treatment an effective amount of a compound as defined in claim **1**.

4,118,502
AMIDINOFORMIC AND AMIDINO-SULPHINIC ACID DERIVATIVES

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, and Rodney Christopher Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

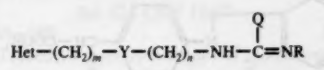
Filed Mar. 2, 1977, Ser. No. 773,590

Claims priority, application United Kingdom, Mar. 11, 1976, 09750/76

Int. Cl.[2] **A61K** *31/415;* **C07D** *233/64*

U.S. Cl. 424—273 R **14 Claims**

1. A compound of the formula



wherein Het is an imidazole ring, which ring is attached at a ring carbon and which ring is optionally substituted by lower alkyl, halogen, lower alkoxy, trifluoromethyl or hydroxymethyl; *m* is 0, 1 or 2 and *n* is 2 or 3 provided that the sum of

m and *n* is 3 or 4; Y is sulphur, methylene or oxygen; *R* is hydrogen, lower alkyl or Het—$(CH_2)_m$— Y—$(CH_2)_n$— where Het, *m*, *n* and Y are as defined above; Q is —CO_2H or —SO_2H; or a pharmaceutically acceptable acid addition salt thereof.

13. A method of blocking histamine H_2—receptors which comprises administering to an animal in need thereof in an effective amount to block said receptors a compound of claim 1.

4,118,503

PYRROLIDONECARBOXYLIC ACID THERAPEUTIC AGENTS

Albin J. Nelson, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

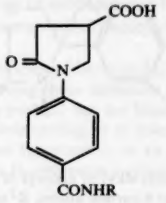
Division of Ser. No. 647,132, Jan. 7, 1976, Pat. No. 4,064,264. This application Oct. 3, 1977, Ser. No. 838,855

The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 **7 Claims**

1. A pharmaceutical composition suitable for oral administration comprising a pharmaceutically acceptable carrier and a therapeutically-effective amount of an anti-ulcer agent selected from the group consisting of an N-(p-benzamido)-2-pyrrolidone-4-carboxylic acid of the formula:



and the lower alkyl esters and the unsubstituted amide derivative thereof, and the base salts of said acid with pharmacologically acceptable cations, wherein R is a member selected from the group consisting of alkyl having from seven to eighteen carbon atoms arranged in a straight chain, benzyl and β-phenylethyl.

4,118,504

ISOINDOLINE DERIVATIVES FOR TREATING PAIN

PierNicola Giraldi, Milan; Giuliano Nannini, Bresso (Milan); Willy Logemann, Milan; Raffaele Tommasini, Milan; Ada Buttinoni, Milan, and Giovanni Biasoli, Gavirate (Varese), all of Italy, assignors to Carlo Erba, Milan, Italy

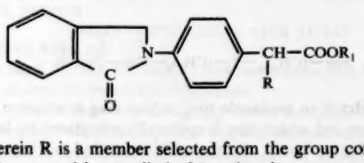
Division of Ser. No. 535,793, Dec. 23, 1974, which is a division of Ser. No. 432,490, Jan. 11, 1974, abandoned, which is a division of Ser. No. 194,500, Nov. 1, 1971, abandoned. This application Jan. 28, 1977, Ser. No. 763,522

Claims priority, application Italy, Nov. 5, 1970, 31334 A/70; Nov. 10, 1970, 31514 A/70

Int. Cl.[2] A61K *31/40*

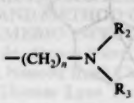
U.S. Cl. 424—274 **2 Claims**

1. The treatment of pains, said treatment comprising administering to a patient in need of such treatment a therapeutically effective amount of a compound of the formula:

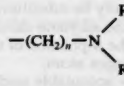


(I)

wherein R is a member selected from the group consisting of hydrogen and lower alkyl of 1 to 4 carbon atoms, and R_1 is a member selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbon atoms and a group of general formula



wherein *n* is 1 or 2 and R_2 and R_3 are independently selected from the group consisting of hydrogen and lower alkyl of 1 to 4 carbon atoms; a salt of a compound of general formula (I), wherein R_1 is hydrogen, with a physiologically acceptable base or a salt of a compound of general formula (I), wherein R_1 is the group



with a physiologically acceptable acid.

4,118,505

NOVEL CYCLOPROPANECARBOXYLATES

Shigeyoshi Kitamura, Saitama; Nobushige Itaya, Nishinomiya; Yoshitoshi Okuno; Nobuo Ohno, both of Toyonaka; Takashi Matsuo, Nishinomiya; Masachika Hirano; Toshio Mizutani, both of Toyonaka, and Hisami Takeda, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

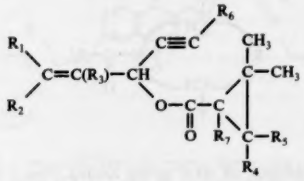
Continuation-in-part of Ser. No. 461,029, Apr. 15, 1974, Pat. No. 4,003,945. This application Dec. 2, 1975, Ser. No. 636,981

Claims priority, application Japan, Apr. 20, 1973, 48-45915; May 27, 1973, 48-58830; Jun. 4, 1973, 48-63118

Int. Cl.[2] C07C *69/74*; A01N *9/24*

U.S. Cl. 424—275 **13 Claims**

1. Alkynyl esters of cyclopropanecarboxylic acid represented by the formula (I),



wherein R_1 represents hydrogen, lower alkyl having 1 – 4 carbon atoms, lower alkenyl having 2 – 4 carbon atoms, lower alkynyl having 2 – 4 carbon atoms, C_1–C_2 alkoxy-C_1–C_4 alkyl, C_1–C_2 alkylthio-C_1–C_4 alkyl, furyl, thienyl, furfuryl, thenyl, cyclo-C_3–C_6-alkyl, cyclo-C_5 alkyl containing an oxygen atom in the ring, cyclo-C_5–C_6 alkenyl, cyclo-C_4–C_5 alkenyl containing an oxygen atom in the ring or

in which X is halogen, nitro, cyano, methylenedioxy, C_1–C_3 alkyl, C_1–C_2 alkoxy, dimethylamino, *n* is 0, 1 or 2 and each X may be different when *n* is 2; R_2 and R_3 individually represent hydrogen, halogen (except R_2), phenyl, benzyl, lower alkyl having 1 – 3 carbon atoms, lower alkenyl having 1 – 3 carbon atoms, lower alkenyl having 2 – 3 carbon atoms or may form a carbon-carbon bond or are bonded to each other at the ends to form C_3–C_4 polymethylene chain or R_1 and R_2 are bonded to each other at the ends to form C_5 polymethylene chain; R_4

represents hydrogen or methyl; R_5 represents hydrogen, methyl, vinyl, 1-propenyl, 2-methyl-1-propenyl, 2-methoxymethyl-1-propenyl, 2-methoxycarbonyl-1-propenyl, or cyclopentylidenemethyl when R_4 is hydrogen, and R_5 represents methyl when R_4 is methyl; and R_6 and R_7 represent hydrogen or methyl.

4,118,506

PHARMACEUTICAL COMPOSITIONS CONTAINING 1,3-DITHIOL-2-YLIDENE MALONATE DERIVATIVES

Kuniaki Taninaka, Ibaragi; Hitoshi Kurono, Amagasaki, and Tsutomu Kasai, Sakai, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

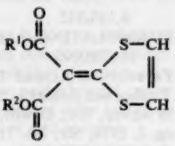
Continuation-in-part of Ser. No. 584,412, Jun. 6, 1975, abandoned. This application May 20, 1977, Ser. No. 799,027

Claims priority, application South Africa, May 24, 1976, 76/3077

Int. Cl.² A61K *31/385*

U.S. Cl. 424—277 **31 Claims**

1. A pharmaceutical composition for preventing liver necrosis, for preventing and curing hepatitis or fatty liver, for curing hepatocirrhosis, and for formation and excretion of bile flow or biliary salt, containing an effective amount sufficient for said purpose of a compound having the general formula,



wherein R^1 and R^2, which may be same or different, represent individually a C_1–C_4 alkyl group, and a pharmaceutically acceptable diluent.

4,118,507

BENZODIOXINCARBOXAMIDE LIPOGENESIS INHIBITORS

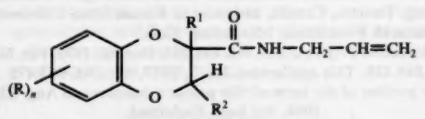
John B. Carr, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 17, 1977, Ser. No. 778,535

Int. Cl.² A61K *31/335*

U.S. Cl. 424—278 **2 Claims**

1. A method of inhibiting lipogenesis in a mammal, which comprises administering, to a mammal in need of such treatment, orally or parenterally an effective amount of a compound of the formula:



wherein *n* is zero or one, R is halogen; nitro; amino; methylsulfonylamino; trifluoromethyl; alkyl or alkoxy of from one to six carbon atoms; cycloalkyl or cycloalkyloxy of from three to six carbon atoms; phenyl or phenoxy, or either of these substituted by one or two of one or more of alkyl of from one to six carbon atoms, halogen and nitro, and R^1 and R^2 each is hydrogen or alkyl of from one to four carbon atoms, at least one being hydrogen.

4,118,508

PHARMACOLOGICALLY EFFECTIVE SUBSTANCE FROM PLANTS BELONGING TO THE FAMILY OF LABIATAE

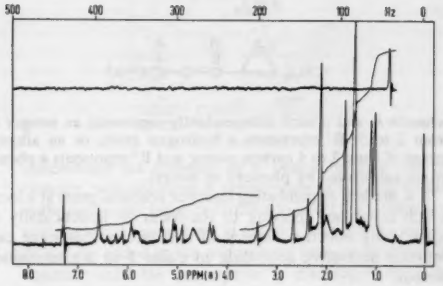
Sujata Vasudev Bhat, Thana; Noel John de Souza, Bombay; Horst Dornauer, Bombay; Bani Kanta Bhattacharya, Bombay, and Alihussein Nomanbhai Dohadwalla, Bombay, all of India, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 26, 1977, Ser. No. 791,020

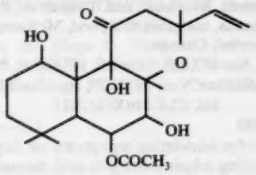
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 2640275

Int. Cl.² A61K *31/35*; C07D *311/02*

U.S. Cl. 424—283 **3 Claims**



1. A compound, in purified and isolated form, having a melting point from 208° C. to 211° C., the molecular formula $C_{22}H_{34}O_7$, and the structural formula



4,118,509

3,5,5-TRIMETHYLHEXANOYL FERROCENE

Rudolf Lattrell; Heinrich Kief, both of Konigstein, and Hermann Bähr, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

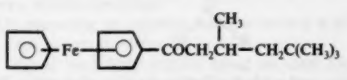
Filed May 24, 1977, Ser. No. 799,973

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623486

Int. Cl.² C07F *15/02*

U.S. Cl. 424—295 **3 Claims**

1. 3,5,5-Trimethylhexanoyl-ferrocene of the formula



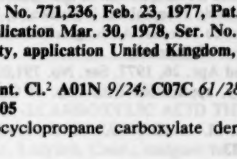
I

4,118,510
DISPIROCYCLOPROPANE CARBOXYLATE PESTICIDES

Royston H. Davis, and Robert J. G. Searle, both of Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 771,236, Feb. 23, 1977, Pat. No. 4,100,298. This application Mar. 30, 1978, Ser. No. 891,573
Claims priority, application United Kingdom, Mar. 22, 1976, 11440/76
Int. Cl.[2] A01N *9/24;* C07C *61/28*
U.S. Cl. 424—305 8 Claims

1. A dispirocyclopropane carboxylate derivative of the formula



wherein *m* and *n* each independently represents an integer of from 2 to 5; R^1 represents a hydrogen atom, or an alkynyl group of from 2 to 4 carbon atoms; and R^2 represents a phenyl group substituted by phenoxy or benzyl.

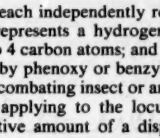
7. A method of combating insect or arachnid pests at a locus which comprises applying to the locus an insecticidally or acaracidally effective amount of a dispirocyclopropane carboxylate derivative according to claim 1 or a composition thereof.

4,118,511
ARYLOXY AMINOBUTANOLS FOR ALLEVIATING SYMPTOMS OF DEPRESSION

Jean-Marie Ferland, St. Laurent; Réal Laliberté, Chomedey; Wilbur Lippmann, Montreal, and Thomas A. Pugsley, Kirkland, all of Canada, assignors to Ayerst, McKenna & Harrison Limited, Montreal, Canada

Division of Ser. No. 687,852, May 19, 1976, Pat. No. 4,071,552. This application Nov. 18, 1977, Ser. No. 852,657
Int. Cl.[2] A61K *31/135*
U.S. Cl. 424—330 4 Claims

1. A method for alleviating symptoms of depression in a mammal comprising administering to said mammal an antidepressant effective amount of a compound of the formula,



in which Ar is phenyl or 1-naphthyl; R^1 is hydrogen or lower alkyl; and R^2 and R^3 are either the same or different selected from the group consisting of hydrogen or lower alkyl having 1–2 carbons; with the proviso that when Ar is 1-naphthyl then

is selected from the group consisting of amino, ethylamino and dimethylamino; and with the proviso that when Ar is phenyl then

is methylamino; and with the further proviso that when R^1 is lower alkyl then R^2 is the same lower alkyl; or a therapeutically acceptable acid addition salt thereof.

4,118,512
YEAST HYDROLYZATE ORAL INGESTA FOR ANIMALS

Robert J. Eichelburg, Woodland Rd., Pound Ridge, N.Y. 10576

Continuation-in-part of Ser. No. 448,208, Mar. 5, 1974, Pat. No. 3,997,675, Ser. No. 463,314, Apr. 23, 1974, Pat. No. 4,000,319, and Ser. No. 473,347, May 28, 1974, abandoned. This application Jul. 25, 1975, Ser. No. 598,993
Claims priority, application Canada, Feb. 14, 1975, 220133; France, Mar. 5, 1975, 75 06832; United Kingdom, Feb. 17, 1975, 06622/75
The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.
Int. Cl.[2] A23L *1/28;* A61K *35/72*
U.S. Cl. 424—359 9 Claims

1. A method for improving the palatability of oral ingesta for cats selected from a member of the group consisting of cat food and cat medicaments comprising combining said ingesta with yeast hydrolyzates in an amount sufficient to impart improved palatability to said ingesta, said yeast hydrolyzates being selected from a member of the group consisting of hydrolyzates of ascomycetous yeasts and asporogenous yeasts and feeding to said cat said oral ingesta combined with said yeast hydrolyzate.

4,118,513
METHOD OF FORMULATING DAIRY CATTLE RATIONS

Darwin G. Braund, Fayetteville; Kendall L. Dolge, Manlius; Richard L. Goings, Fabius, and Robert L. Steele, Syracuse, all of N.Y., assignors to Agway, Inc., Dewitt, N.Y.

Filed Aug. 2, 1976, Ser. No. 711,095
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—2 5 Claims

1. A method of formulating dairy cattle rations for optimized milk production comprising the steps of:

(a) establishing the total protein requirements for specified lactating dairy cow(s);

(b) determining the amount and proportion of soluble and insoluble protein in each of the components of the total ration to be fed to said cow(s); and

(c) adjusting the proportion and composition of at least one of said components to provide said total protein requirements and to adjust the proportion of soluble and insoluble protein to a level wherein at least 15% but not more than 25% of said total protein is soluble in the rumen of said cow(s).

4,118,514
NONFAT DRY MILK SUBSTITUTE FOR YEAST-LEAVENED BAKED PRODUCTS

Russell C. Hoseney, Manhattan, Kans., and Rujira Srisuthep Ling, Toronto, Canada, assignors to Kansas State University Research Foundation, Manhattan, Kans.

Continuation-in-part of Ser. No. 641,293, Dec. 16, 1975, Pat. No. 4,044,155. This application Jul. 7, 1977, Ser. No. 813,475
The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.
Int. Cl.[2] A21D *2/02*
U.S. Cl. 426—62 8 Claims

1. A functional substitute for nonfat dry milk in yeast-leavened dough, said substitute comprising from about 30 to 75% by weight of deproteinized whey and an amount of a substance which serves as a source of ammonium ion in said dough, said substance being present at a level to provide from about 1 to 10% by weight of ammonium ion on a calculated basis in said substitute.

4,118,515

PREPARATION OF A STABLIZED PAPAIN SOLUTION

Günter Römmele, Riehen, and Ruth Hagemann, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 15, 1976, Ser. No. 750,785
Claims priority, application Switzerland, Dec. 23, 1975, 16703/75
Int. Cl.[2] C12H *1/12*; C07G *7/02*
U.S. Cl. 426—63 3 Claims

1. A process for preparing an aqueous papain solution comprising from 20 to 60% by weight of sucrose, from 1.5 to 3% by weight of sodium metabisulphite and from 1 to 35% by weight of papain, which process comprises the steps of (1) dissolving sodium metabisulphite in water and adjusting the pH to about 4.85 by addition of sodium hydroxide, (2) adding papain to obtain a turbid solution, (3) clarifying the turbid solution by filtration or centrifugation and (4) adding sucrose while stirring.

4,118,516

USE OF CARAMEL COLOR FOR AUGMENTING OR ENHANCING OR INTENSIFYING THE COLOR OF NATURAL RED DYESTUFFS

Michel Van Praag, Tilburg, and Gerrit Duijf, Koog aan de Zaan, both of Netherlands, assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 26, 1977, Ser. No. 800,885
Int. Cl.[2] A23L *1/27, 1/275*
U.S. Cl. 426—96 4 Claims

1. A composition having an enhanced red color without a blue or violet sheen comprising caramel color and a betalaine dye which is a red beet dye and, in addition, a stabilizing quantity of ascorbic acid, the said composition being an aqueous solution, said caramel color being in an amount of from 2.5 to 15% by weight of said solution.

4,118,517

METHOD OF PREPARING FISH MEAT POWDER HAVING KAMABOKO-FORMING PROPERTY

Hiroshi Niki; Eiki Deya; Toru Doi, all of Sapporo; Seiichiro Igarashi, Tokorozawa, and Hiromichi Hayashi, Sapporo, all of Japan, assignors to Snow Brand Milk Products Co. Ltd., Sapporo, Japan

Continuation of Ser. No. 557,997, Mar. 13, 1975, abandoned.
This application Jun. 24, 1977, Ser. No. 809,919
Claims priority, application Japan, Aug. 2, 1974, 49-88776
Int. Cl.[2] A22C *25/00*
U.S. Cl. 426—271 5 Claims

1. A method of preparing fish meat powder capable of forming KAMABOKO comprising:

forming a fish meat slurry in a buffer solution containing (1) divalent metal ions and (2) sodium carbonate and citric acid or sodium citrate and citric acid, said buffer solution having an approximately neutral pH; the anions of said buffer solution being present in an amount sufficient to sequester said divalent metal ions but do not form an insoluble substance during preparation of the slurry; and subsequently

spray-drying said fish meat slurry wherein the sequestered divalent metal ions form a sparingly soluble divalent metal salt during the spray drying.

4,118,518

METHOD OF PRODUCING CONCENTRATED SAUCE PRODUCT

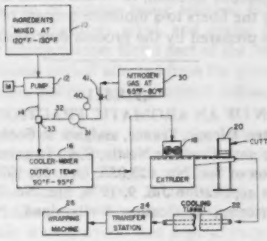
E. Firth Perryman, Webster, N.Y., assignor to The R.T. French Company, Rochester, N.Y.

Filed Apr. 27, 1977, Ser. No. 791,234
Int. Cl.[2] A23P *1/00*
U.S. Cl. 426—516 7 Claims

1. In a method of producing a concentrated food product, wherein the ingredients of an edible food concentrate are mixed, pumped in fluid form to and through a heat exchanger, pumped to an extruder having a discharge at atmospheric pressure, extruded, and then cut into small pieces, the improvement comprising

feeding a gas under pressure above atmospheric into the concentrate as it is being pumped to said exchanger,

controlling the rate of flow of said concentrate through the heat exchanger so that the temperature and pressure of the



concentrate are lowered as it passes through the exchanger, with the drop in temperature of the concentrate in the exchanger being controlled to offset the tendency of said gas in the concentrate to expand, whereby the volume of the gas added to the concentrate remains substantially constant until the concentrate is discharged from the exchanger, and

allowing the volume of said gas to expand during passage of the concentrate through the extruder.

4,118,519

METHOD OF PRODUCING SMOKE FLAVORING FOR FOODS

Hyunil Juhn, and Hugo E. Wistreich, both of Chicago, Ill., assignors to B. Heller & Company, Chicago, Ill.

Filed Aug. 11, 1976, Ser. No. 713,390
Int. Cl.[2] A23L *1/232*
U.S. Cl. 426—533 4 Claims

1. A method for producing a smoke flavoring composition for foods comprising providing an aqueous liquid smoke containing smoke flavoring ingredients extracted from smoke vapors, contacting the aqueous liquid smoke with an edible oil having dissolved therein a mono and/or diglyceride of a fat forming fatty acid having an HLB below 7 by liquid-liquid extraction in an amount to constitute 1–20% by weight of the composition, whereby smoke flavoring ingredients are extracted by the edible oil from the aqueous liquid smoke, and then separating the aqueous phase from the oily phase containing smoke flavoring ingredients extracted from the aqueous liquid smoke.

4,118,520

PROTEIN FIBRES

Johannes Visser, Maassluis; Raoul Henricus Josephus Oosthoek, Rotterdam; Jan Willem Groeneweg, Dordrecht, and Hendrik Dijkstra, Vlaardingen, all of Netherlands, assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Mar. 9, 1977, Ser. No. 775,772
Claims priority, application United Kingdom, Mar. 26, 1976, 12223/76
Int. Cl.[2] A23J *3/02, 3/00*
U.S. Cl. 426—574 13 Claims

1. A process for producing casein-containing mixed protein fibers, which comprises:

(1) preparing an aqueous mixture having a pH from 5.0 to 6.6, which contains:

(a) at least 30% protein based on total mixture weight, which protein consists of casein in a proportion varying

from 90 to 30% and at least one heat-settable protein in a proportion varying from 10 to 70%, based on the total weight of the protein;

(b) at least 0.1 mM calcium ions per gram of casein; and

(c) at least 0.04 mM orthophosphate ions per gram of casein,

(2) spinning such mixture, at a temperature ranging from room temperature up to a temperature just below the mixture's gelling point, through the orifices of a spinneret into a gaseous medium, to obtain fibers, and,

(3) drying the fibers to a moisture content of less than 11%.

13. Fibers prepared by the process described in claim **1**.

4,118,521

ISOLATION OF AN AROMATIC FRACTION OF COFFEE

Paul Cazenave, Dieppe, France, assignor to Societe d'Assistance Technique pour Produits Nestle, S.A., Lausanne, Switzerland

Continuation of Ser. No. 623,055, Oct. 16, 1975, abandoned. This application Jul. 9, 1976, Ser. No. 703,980

Claims priority, application Switzerland, Nov. 11, 1974, 15042/74

Int. Cl.[2] **A23F** *3/00, 5/00*

U.S. Cl. 426—651 **9 Claims**

1. A process for isolating an aromatic coffee fraction from an aqueous medium containing said fraction which comprises contacting the aqueous medium with an organic solvent which is an azeotrope mixture having a boiling point below about 50° C and which is selected from the group consisting of

pentane/methylene chloride	68 -32%
and	
pentane/freon 113 (trichloro-trifluorethane)	94 -6%

and recovering a solvent phase containing the aromatic fraction which is then concentrated by distillation.

4,118,522

METHOD AND DEVICE FOR THE COATING OF TABLETS

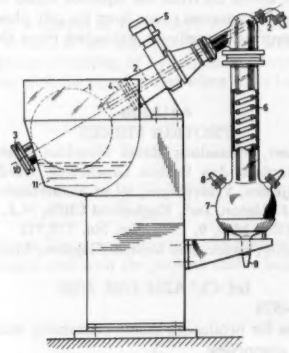
Bruno Stellmach, Schillerstrasse, 52, 3052 Bad Nenndorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 461,052, Apr. 15, 1974, abandoned. This application Feb. 10, 1977, Ser. No. 767,414

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1973, 2319960

Int. Cl.[2] **B05D** *7/00*

U.S. Cl. 427—3 **1 Claim**



1. A method of coating medicinal tablets comprising the steps of:

introducing the tablets into a rotatable evaporating vessel;

Evacuating said vessel to establish a vacuum therein of about 1 mmHg;

rotating said vessel; and

spraying a suspension comprising a solvent and a sugar-containing solid coating material onto said tablets, while said vessel is rotated and subject to said vaccum, to effect successive application of a plurality of thin, sugar-containing films on said tablets, and

recovering said solvent for reuse as part of the coating suspension.

4,118,523

PRODUCTION OF SEMICONDUCTOR DEVICES

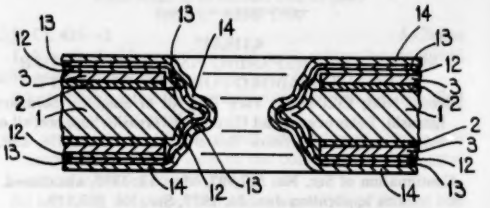
Kenneth Charles Arthur Bingham, Macclesfield; Alan George Albert Gillingham, Disley, and Colin Baldwin, Altringham, all of England, assignors to International Computers Limited, London, England

Continuation of Ser. No. 730,947, Oct. 8, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,392

Claims priority, application United Kingdom, Oct. 22, 1975, 43289/75

Int. Cl.[2] **B05D** *5/12;* **H05K** *3/00*

U.S. Cl. 427—97 **1 Claim**



1. A method of electrically interconnecting conductors formed by first and second metal layers respectively on opposing faces of a polyimide substrate by a third electrically conductive layer within a bore extending through the substrate at a desired position, including the steps of:

(a) forming a hole in the first and second layers to expose underlying areas of the substrate, the holes in the said layers corresponding and being positioned opposite to one another at said desired position of the bore;

(b) applying simultaneously to both faces an etchant to act upon the said underlying areas of substrate to etch out the desired bore, the position of which is defined by the masking action of the remaining part of the first and second layers, but the effect of the etchant being such as to remove more substrate material adjacent to said layers than in the central part of the bore so as to produce an overhanging region of each such layer around the bore;

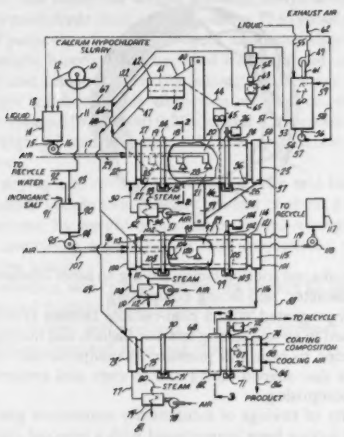
(c) then etching away further portions of the first and second layers to an extent sufficient to remove all of said overhanging regions and to expose the faces of the substrate immediately adjacent to the ends of the bore;

(d) and thereafter depositing the third conductive metal layer in the bore to form an electrically conductive connection between the first and second layers.

4,118,524
GRANULAR CALCIUM HYPOCHLORITE BY SPRAY GRAINING

Walter C. Saeman, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 521,417, Nov. 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 276,615, Jul. 31, 1972, abandoned. This application Oct. 26, 1976, Ser. No. 735,575
The portion of the term of this patent subsequent to Jul. 13, 1993, has been disclaimed.
Int. Cl.[2] **C01B** *11/06*
U.S. Cl. 427—213 **12 Claims**



1. A method for preparing particulate solid calcium hypochlorite having a smooth rounded surface from a pumpable and sprayable aqueous slurry of calcium hypochlorite which comprises:

(a) maintaining in a rotary spray grainer a moving bed of particulate solid calcium hypochlorite containing from about 5 to about 30 percent by weight of water in the lower part of a distributing zone having an upper part and a lower part,

(b) maintaining a temperature in said distributing zone in the range from about 40° to about 70° C.,

(c) lifting a portion of said moving bed to said upper part and releasing said particles to separately fall through said distributing zone to said bed,

(d) spraying on said falling particles a pumpable and sprayable aqueous slurry of calcium hypochlorite containing from about 45 to about 90 percent by weight of water,

(e) simultaneously evaporating and removing water from said slurry on said falling particles whereby said particles are coated with a layer of solid calcium hypochlorite, and the water content is from about 5 to about 30 percent by weight, and

(f) removing at least a portion of the resulting coated rounded solid calcium hypochlorite particles from said distributing zone.

4,118,525
ARTICLE AND METHOD FOR FABRIC SOFTENING AND STATIC CONTROL

Kenneth L. Jones, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 25, 1977, Ser. No. 781,399
Int. Cl.[2] **B05D** *3/12;* **D06M** *13/12*
U.S. Cl. 427—242 **14 Claims**

1. A laundry article, providing fabric softening and static control benefits in a laundry dryer, for use in both the washer and the dryer, consisting essentially of a water-insoluble substrate, carrying an effective amount of an intimate mixture, having a maximum solubility in water of 50 ppm at 25° C., and a softening point of from 100° to 200° F., consisting essentially of

(a) from about 10 to 90% by weight of quaternary ammonium fabric conditioning compounds having the formula $[R_1R_2R_3R_4N]^+Y^-$, wherein at least one, and not more than two, of the R_1, R_2, R_3, or R_4 groups is an organic radical containing a group selected from a C_{12} to C_{22} aliphatic radical, or an alkyl phenyl or alkyl benzyl radical having 10 to 16 carbon atoms in the alkyl chain, the remaining group or groups being selected from C_1 to C_4 alkyl, C_2 to C_4 hydroxy alkyl, and cyclic structures in which the nitrogen atom forms part of the ring, Y constitutes an anionic radical selected from the group consisting of hydroxide, halide, sulfate, methyl sulfate, and phosphate ions; and

(b) from about 10 to 90% by weight of a dispersion inhibitor mixture, being a solid organic material having a maximum solubility in water of 50 ppm at 25° C. and a softening point in the range of 100° F. to 200° F., said mixture consisting of a material selected from the group consisting of paraffinic waxes, cyclic and acyclic mono- and polyhydric alcohols, substituted and unsubstituted aliphatic carboxylic acids, condensates of C_2 to C_4 alkylene oxide with any of the foregoing types of materials wheter or not said materials themselves meet the above solubility and softening point limits, and mixtures thereof, together with a material selected from the group consisting of esters of cyclic and acyclic mono- and polyhydric alcohols and acids, and mixtures thereof.

6. A method of providing fabric softening and static control benefits to fabrics, comprising the steps of:

(a) agitating said fabrics in an aqueous laundry washing solution to which has been added a laundry article consisting essentially of a water-insoluble substrate, carrying an intimate mixture in an amount effective to yield said fabric softening and static control benefits while being tumbled in a laundry dryer with said fabrics in subsequent step (b), said mixture having a maximum solubility of 50 ppm at 25° C., a softening point of from 100° to 200° F., and consisting essentially of:

(i) from about 10 to 90% by weight of a quaternary ammonium fabric conditioning compound having the formula $[R_1R_2R_3R_4N]^+Y^-$, wherein at least one, and not more than two, of the R_1, R_2, Rhd 3, and R_4 groups is an organic radical containing a group selected from a C_{12} to C_{22} aliphatic radical, or an alkyl phenyl or alkyl benzyl radical having 10 to 16 carbon atoms in the alkyl chain, the remaining group or groups being selected from C_1 to C_4 alkyl, C_2 to C_4 hydroxy alkyl, and cyclic structures in which the nitrogen atom forms at least part of the ring, and Y constitutes an anionic radical selected from the group consisting of hydroxide, halide, sulfate, methyl sulfate, and phosphate ions; and

(ii) from about 10 to 90% by weight of a dispersion inhibitor, being a solid organic material having a maximum solubility in water of 50 ppm at 25° C. and a softening point in the range of 100° F. to 200° F., said material being selected from the group consisting of paraffinic waxes, cyclic and acyclic mono- and polyhydric alcohols, substituted and unsubstituted aliphatic carboxylic acids, esters of cyclic and acyclic mono- and polyhydric alcohols and acids, condensates of C_2 to C_4 alkylene oxide with any of the foregoing types of materials whether or not said materials themselves meet the above solubility and softening point limits, and mixtures thereof, whereby said intimate mixture remains substantially intact on said substrates; and

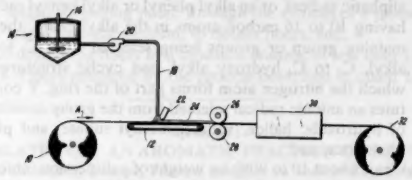
(b) tumbling said fabrics, under heat, in a laundry dryer together with said laundry article whereby said intimate mixture softens under the dryer heat and is disposed onto said fabrics.

4,118,526

METHOD FOR TREATING FABRICS

Razmic S. Gregorian, Aiken, and Chettoor G. Namboodri, North Augusta, both of S.C., assignors to United Merchants and Manufacturers, Inc., New York, N.Y.

Filed Jun. 6, 1975, Ser. No. 584,389
Int. Cl.[2] B41M *1/10;* D06M *1/00, 13/34*
U.S. Cl. 427—350 11 Claims



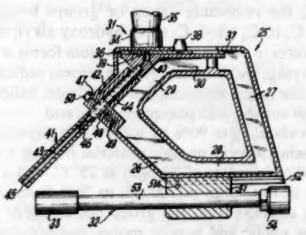
1. In a method for treating a fabric with a finishing agent wherein the finishing agent in a liquid medium is applied to the fabric and the fabric is then subjected to drying and a fixation or curing step, the improvement which comprises using a treating composition which is stable and will substantially retain its physical properties until such time as pressure is applied thereto composed of a fabric finishing agent in an amount effective to impart the properties of the finishing agent to the fabric, and about 0.5 to 8 weight percent of a foam stabilizer, the remainder of the composition being a liquid diluent and conventional additives, foaming the treating composition into a foam having a blow ratio in the range from about 2:1 to 20:1 and a foam density in the range from about 0.5 gm/cc to 0.05 gm/cc, applying a bank of the foam directly on to a fabric, reducing the thickness of the foam in contact with the fabric with the foam substantially retaining its physical properties, collapsing the foam and forcing the foam into the coated fabric by applying pressure and then subjecting the fabric to said drying and curing or fixation steps.

4,118,527

METALIFEROUS FLAME SPRAY MATERIAL FOR PRODUCING MACHINABLE COATINGS

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Division of Ser. No. 706,136, Jul. 19, 1976, Pat. No. 4,039,318.
This application Apr. 6, 1977, Ser. No. 785,224
Int. Cl.[2] B05D *1/08*
U.S. Cl. 427—423 12 Claims



1. A method of producing an adherent bond coat on a metal substrate which comprises:

flame spraying onto said metal substrate a metaliferous flame spray material comprising a plurality of ingredients physically combined together with each other,

said plurality of ingredients comprising by weight about 3% to 15% aluminum, about 2% to 15% refractory metal silicide and the balance essentially a metal selected from the group consisting of nickel-base, cobalt-base, iron-base and copper-base metals,

and continuing said spraying to form an adherent bond coat on said substrate characterized by improved machinability, improved bonding strength and improved resistance to wear.

4,118,528

GLASS FIBER FRICTION FACING

Blaine E. Lowry, Manheim, Pa., assignor to Raybestos Manhattan, Inc., Trumbull, Conn.

Filed Jul. 28, 1977, Ser. No. 819,760
Int. Cl.[2] B32B *5/08;* B22B *5/26*
U.S. Cl. 428—65 19 Claims

1. A disc-shaped friction facing having an inner diameter and an outer diameter, said facing comprising

a tape impregnated with a heat-curable cement system and disposed in an undulating annular fashion and having been subjected to heat and pressure to compress said tape to form a disc-shaped facing and to cure said cement, said tape comprising

a plurality of rovings of substantially continuous glass filaments having been impregnated with a pre-coat composition and then impregnated with a heat-curable cement system, each impregnation having been accomplished by passing said rovings through aqueous dispersions of the respective pre-coat composition and cement system, said dispersions containing from about 0.25 to about 1.25 percent, by weight of solids, of a surfactant or dispersant, and the surfaces of said filaments prior to said impregnations having been treated with an anchoring agent capable of providing a strong bond between said filament surfaces and said pre-coat composition, said pre-coat compositions comprising from about 40 to about 50 percent of a vulcanizable carboxy nitrile rubber, from about 40 to about 50 percent of a watersoluble, low molecular weight, one-step phenol formaldehyde resin and from about 16 to about 20 percent furnace black having a particle size in the range of about 65 to about 85 mμ, said percentages being by weight based on the combined weight of said pre-coat constituents, and said cement system comprising from about 6 to about 12 percent of said vulcanizable rubber, from about 12 to about 16 percent of said phenol formaldehyde resin, and about 72 to 82 percent particulate friction modifiers, said percentages being by weight, based on the combined weight of said constituents forming said cement system.

10. The method of forming an annular friction facing for a clutch or the like comprising the steps of:

(A) impregnating plurality of rovings formed of substantially continuous glass filaments with a pre-coat composition comprising about 40 to about 50 percent of a vulcanizable carboxy nitrile rubber, about 40 to about 50 percent of a water soluble, low molecular weight, one-step thermosetting phenol formaldehyde resin, and about 10 to about 20 percent of furnace black having a particle size in the range of about 65 to about 85 mμ, said percentages being by weight, based on the combined weight of said components, by passing said rovings through a low solids aqueous dispersion of said pre-coat composition containing from about 0.25 to about 1.25 percent, based on weight of pre-coat solids, of a surfactant or dispersant, the sur-

faces of said filaments of said rovings having been treated with an anchoring agent capable of providing a strong bond between said filaments and said pre-caot composition;

(B) drying said pre-coat impregnated rovings to a moisture content in the range of about 2 to about 4 percent, by weight of said coated rovings;

(C) further impregnating said pre-coat impregnated rovings with a heat-curable cement system comprising from about 6 to about 12 percent of a vulcanizable carboxy nitrile rubber, from about 12 to about 16 percent of a water-soluble, low molecular weight one-step, thermosetting phenol formaldehyde resin, and from about 72 to about 82 percent of particulate friction modifiers, said percentages being by weight, based on the combined weight of said components of said cement system, by passing said rovings through a high solids aqueous dispersion of said cement system containing from about 0.25 to about 1.25 percent, based on weight of cement system solids, of a surfactant or dispersant;

(D) drying said rovings impregnated with said heat-curable cement system to a moisture content of about 2 to about 4 percent, by weight of said impregnated rovings;

(E) combining a plurality of said impregnated rovings to form a tape;

(F) winding said tape in undulating fashion to form a disc-shaped friction facing preform; and

(G) subjecting said preform to heat and pressure to densify said preform and cure said cement.

4,118,529

SUEDE WOVEN FABRIC AND A PROCESS OF MANUFACTURING THE SAME

Junyo Nakagawa; Takao Akagi, and Koji Hiramatsu, all of Kurashiki, Japan, assignors to Kuraray Company, Limited, Japan

Continuation-in-part of Ser. No. 705,265, Jul. 14, 1976, abandoned. This application Jun. 3, 1977, Ser. No. 803,265

Claims priority, application Japan, Jul. 14, 1975, 50-85984; Apr. 2, 1976, 51-37586

Int. Cl.[2] D02G *3/00*

U.S. Cl. 428—91 **18 Claims**

1. A suede woven fabric having a pile surface produced by a pile raising operation comprising a warp yarn selected from the group consisting of polyester textured yarn, polyester filament yarn and polyester spun yarn, and a weft yarn of a composite filament yarn of substantially randomly distributed super fine polyester island filaments of differing thickness whose mean thicknesses in denier are within the range from 0.05 to 0.50 and whose degree of variation of thickness is 15 to 60% from the mean; wherein a portion of said island filaments on at least one surface of the fabric is raised to form piles of individual island monofilaments whose mean lengths are from 0.5 to 4.0 mm, wherein the number of floating points on said weft yarn, whose number of floats is within the range of 3 to 11, is 100 to 500/cm^2 of woven fabric; and wherein the relation between the shear stiffness $G_{0.5}$ at a shear angle of 0.5° and the stiffness G_5 at a shear angle of 5°, represented by $G_5/G_{0.5}$, is 1.5 to 15.

4,118,530

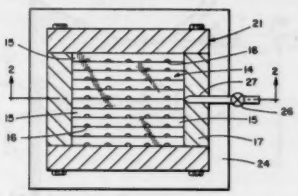
PILE PRODUCT MOLDED OF ETHYLENE/VINYL ACETATE COPOLYMER

Joseph C. Benedyk, Highland Park, Ill., and Richard O. Stratton, DeLand, Fla., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 733,691, Oct. 19, 1976, abandoned, which is a division of Ser. No. 531,190, Dec. 9, 1974, abandoned. This application Feb. 10, 1978, Ser. No. 876,750

Int. Cl.[2] B32B *33/00*

U.S. Cl. 428—92 **10 Claims**



1. A molded pile product comprising:

(a) a base and a plurality of pile fibers extending upright from said base;

(b) the fibers and base being formed from an irradiated polymer mixture comprising at least 90% by weight a copolymer of ethylene and vinyl acetate having a melt index of from 1 to 3 and not more than 1% by weight of a mold release agent;

(c) the fibers having an average diameter in the range of approximately 4 to 10 mils, an average length in the range of approximately 200 to 700 mils, an aspect ratio in the range of approximately 50 to 100, and a fiber density in the range of approximately 10 to 50%; and

(d) the pile product having been molded by heat and pressure in cavities corresponding to the fibers of the pile product and removed from the cavities at a temperature of 140°–170° F., the fibers exhibiting substantially no elongation or breakage in spite of removal from high aspect cavities at said elevated removal temperature.

4,118,531

WEB OF BLENDED MICROFIBERS AND CRIMPED BULKING FIBERS

Edward R. Hauser, Saint Joseph Township, Saint Croix County, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

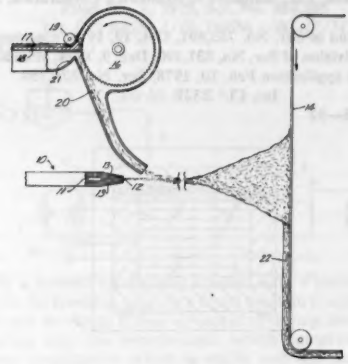
Continuation of Ser. No. 710,612, Aug. 2, 1976, abandoned. This application Nov. 4, 1977, Ser. No. 848,488

Int. Cl.[2] D03D *3/00*; D02G *3/00*

U.S. Cl. 428—224 **11 Claims**

1. A fibrous web comprising microfibers that average less than about 10 micrometers in diameter and crimped bulking fibers that have a percent crimp of at least about 15 percent, the microfibers and crimped bulking fibers being present in a

weight ratio between about 9:1 and 1:9 and being randomly and thoroughly intermixed and intertangled with one another



to form a resiliently compressible fiber structure that has a loft of at least 30 cubic centimeters/gram.

4,118,532

IMPLANTABLE MATERIAL AND METHOD OF PREPARING SAME

Charles A. Homsy, 11526 Raintree Cir., Houston, Tex. 77024

Continuation-in-part of Ser. No. 300,246, Oct. 24, 1972, abandoned. This application Jan. 11, 1977, Ser. No. 758,499

Int. Cl.[2] A61F *1/24*

U.S. Cl. 428—294 **13 Claims**

1. A composition of matter comprising,

a filler element,

a perfluorinated high polymer resin sintered with said filler element to retain said filler element,

said perfluorinated high polymer resin being selected from the group consisting of polytetrafluoroethylene, polyhexafluropropylene, and a copolymer of hexafluoropropylene and tetrafluroethylene,

said filler element being distributed throughout said material, being selected from the group consisting of, fluorinated carbon particles, fluorinated carbon fibers, surface-fluorinated polyimide fibers, surface-fluorinated polyimide particles surface-fluorinated hydrocarbon particles, surface-fluorinated hydrocarbon fibers, polytetrafluoroethylene fibers, and combinations thereof, the fibers of said filler element being oriented substantially parallel to the surface of the material so that the fibers whose ends lie on or near the surface do not have a tendency to break off,

said filler element being approximately 15 to 65 volume percent of said composition,

the critical surface tension of the filler element closely approximately the critical surface tension of the perfluorinated high polymer resin and

said sintered resin and filler element being suitable for in vivo implantation as a wear material.

4,118,533

STRUCTURAL LAMINATE AND METHOD FOR MAKING SAME

Donald E. Hipchen, Seminole; Michael J. Skowronski, and Joseph R. Hagan, both of Clearwater, all of Fla., assignors to Celotex, Tampa, Fla.

Filed Jan. 19, 1976, Ser. No. 649,976

The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.

Int. Cl.[2] B32B *5/20*

U.S. Cl. 428—297 **48 Claims**

48. A structural laminate comprising:

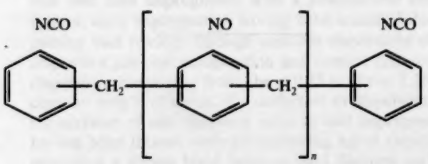
A. two planar facing sheets wherein:

I. each facing sheet is a metal foil between 0.010 and 0.001 inches thick,

II. the surface of one facing sheet observe to that attached to the rigid foam is decoratively embossed;

B. a rigid foam integrally attached upon formation of the foam to one surface of each facing sheet, the rigid foam formed from a foam-forming mixture comprising:

I. a mixture of polymethyl polyphenyl isocyanates, of Formula a:



(a)

wherein *n* is an integer from 0 to 8 and the polyisocyanates have an equivalent weight of 120 to 180 and a functionality of 2.5 to 3.8 and the mixture has a vecosity of 250 to 2500 centipoises;

II. diethylene glycol, wherein the equivalent ratio of I:II is between 3.0:1 and 5.0:1;

III. a catalyst composition in an amount and of a type sufficient to give the foam-forming mixture a cream time between 15 and 20 seconds and a firm time between 25 and 60 seconds;

IV. fluorotrichloromethane in an amount from 5 to 20 weight percent based on the weight of the foam-forming mixture;

V. a surfactant in an amount from 0.1 to 2.0 weight percent based on the weight of the foam-forming mixture.

C. a mat of glass fibers wherein:

I. the glass fibers of the mat are distributed substantially evenly throughout the rigid foam,

II. the glass fibers are non-crimped,

III. the glass fibers have an average length that exceeds five feet,

IV. the glass fibers of the mat are arranged in layers,

V. each layer of glass fibers is substantially parallel to the facing sheet,

VI. the glass fibers within each layer are substantially parallel,

VII. the glass fibers in each layer are at an angle of less than 60° to the glass fibers in each next adjacent layer, and

VIII. the foam-forming mixture completely fills the interstices between the fibers of the mat, the fibers being held in fixed relationship to each other solely by the rigid foam,

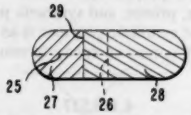
IX. the mat of glass fibers being included in the amount of 6–20 gms. per board-foot of structural laminate.

4,118,534

CRIMPED BICOMPONENT-FILAMENT YARN WITH RANDOMLY REVERSING HELICAL FILAMENT TWIST

Harry Eugene Stanley, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 11, 1977, Ser. No. 795,915
Int. Cl.[2] D02G 3/00
U.S. Cl. 428—370 **6 Claims**



1. A crimped bicomponent-filament yarn comprising fliaments having a polyhexamethyleneadipamide component and a copolyester component adhered together in a side-by-side composite filament of oblong cross section along the length of the filament wherein the length of the major axis of the cross section is between 2.5 and 4.5 times the length of the minor axis, the polyhexamethyleneadipamide component occupies an area at one side of the cross section that extends along said major axis for a distance about equal to the length of said minor axis and is between 20 and 35 percent of the total cross-sectional area; said copolyester component consisting essentially of poly[ethylene terephthalate/5-(sodium sulfo)isophthalate] containing 0.5 to 3 mole percent of the 5-(sodium sulfo)isophthalate units; the bicomponent filaments having a randomly reversing filament twist with an average of 60 to 120 crimps per inch of filament and having the property of splitting into polyhexamethyleneadipamide filaments and copolyester filaments when heated at about 100° C. in 1 percent aqueous caustic solution.

4,118,535

NOVEL POLYETHERAMIDE-IMIDE EPOXY RESIN BLENDS

Eugene G. Banucci, Scotia, and Edith M. Boldebuck, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

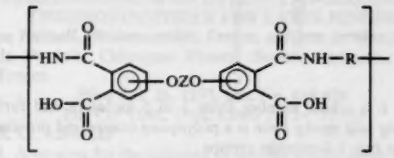
Filed Nov. 3, 1975, Ser. No. 628,331
Int. Cl.[2] C08L 63/00
U.S. Cl. 428—383 **17 Claims**

1. A polyetheramide-imide epoxy resin blend of the formula:

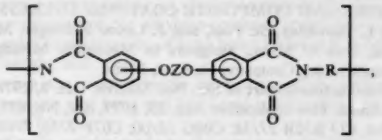
$$([A]_m[B]_{1-m})_a \qquad ([C])_b,$$

polyetheramide-imide resin epoxy resin

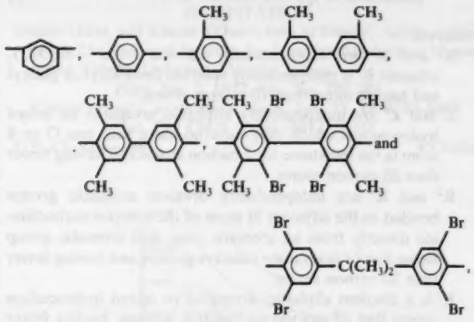
wherein A represents a polyamide unit and B represents a polyimide unit of a polyetheramide-imide resin, *m* represents a mole fraction number greater than or equal to zero, C represents a polyepoxy resin, *a* represents a resin blend proprotion number greater than zero and less than 1, the sum of a plus *b* equals 1.0, further wherein said polyamide units is of the formula:



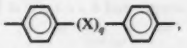
and said polyimide unit is of the formula:



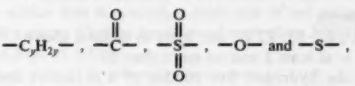
wherein the O—Z—O units of said polyamide or said polyimide units are in the 3 or 3′ or 4 or 4′ positions and Z is a member of the class consisting of (1)



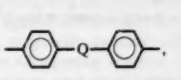
and (2) divalent organic radicals of the general formula



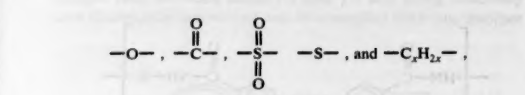
where X is a member selected from the class consisting of divalent radicals of the formulas



where *q* is 0 or 1, *y* is a whole number from 1 to 5, the divalent bonds of the —O—Z—O— radical are situated on the phthalic anhydride-derived units, e.g., in the 3,3′-, 3,4′-, 4,3′- or the 4,4′-positions, and R is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (c) divalent radicals included by the formula



where Q is a member selected from the class consisting of



and x is a whole number from 1 to 5 inclusive and further wherein said epoxy resin is a polyepoxy compound possessing at least two 1,2-epoxide groups.

4,118,536

SILANE-TERMINATED POLYCARBODIIMIDE PRIMERS AND COMPOSITE COATINGS THEREFROM

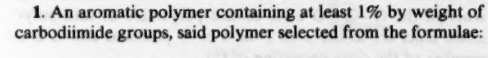
James L. Beardsley, St. Paul, and J. Lamar Zollinger, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 730,810, Oct. 8, 1976, abandoned. This application Aug. 25, 1977, Ser. No. 827,784

Int. Cl.[2] **B32B** *27/38;* **C08G** *18/00;* **C07F** *7/10, 7/18*

U.S. Cl. 428—413 **11 Claims**

1. An aromatic polymer containing at least 1% by weight of carbodiimide groups, said polymer selected from the formulae:



(I)

wherein

R^1 and R^5 are independently selected from $-Si(OR^6)_3$ wherein R^6 is independently selected from alkyl or phenyl and has no more than 10 carbon atoms,

Z and Z′ are independently aliphatic, aromatic, or mixed hydrocarbon which may have no more than one O or S atom in the backbone for 2 carbon atoms and having fewer than 20 carbon atoms

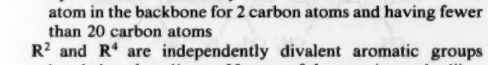
R^2 and R^4 are independently divalent aromatic groups bonded to the adjacent N atom of the exterior carbodiimide directly from an aromatic ring, said aromatic group being free of isocyanate reactive groups and having fewer than 20 carbon atoms

R^3 is a divalent aliphatic, aromatic, or mixed hydrocarbon group free of isocyanate reactive groups, having fewer than 20 carbon atoms

b is > 0

c is 0 or 1

d is 0 or a whole integer and $b+c+d$ is at least 1 and no more than 50,



II.

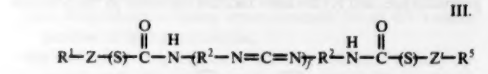
wherein

R^1, R^2, R^4, R^5, Z, Z′, and b are as defined above

$b+e$ = at least 2 and no more than 50

R^7 is the hydrogen free residue of a di-(active hydrogen) terminated compound, said residue having no isocyanate reactive groups and wherein R^2 and R^4 are also directly attached to the nitrogen atom of the adjacent

group from an aromatic ring,

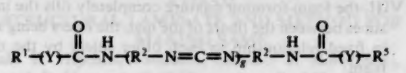


III.

wherein

R^1, R^2, R^5, Z and Z′ are as defined above, and

f is at least 2 and no more than 50, and



IV.

wherein

R^1, R^2, R^5, Z and Z′ are as defined above, and g is at least 2 and no more than 50, and

Y is the residue of a primary amine terminated hydrocarbon formed by the removal of a hydrogen from the amine group, with the hydrogen free residue portion of Y forming a bond with the adjacent group

9. A substrate, a primer layer bonded to the substrate and a synthetic polymer layer bonded to the primer wherein said primer comprises the polymer of claim **1**.

10. The substrate, primer, and synthetic polymer coating of claim **9** wherein the synthetic polymer is an abrasion resistant coating obtained by curing an epoxy-terminated silane.

4,118,537

FLUOROCARBON POLYMER COATINGS

Eva M. Vary, Wynnewood, Pa., and Eustathios Vassiliou, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 636,845, Dec. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 525,672, Nov. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 405,799, Oct. 12, 1973, abandoned. This application Apr. 7, 1977, Ser. No. 785,450

Int. Cl.[2] **B32B** *27/00*

U.S. Cl. 428—422 **17 Claims**

1. An article having a lubricious surface, comprising

(A) a primer coat obtained by curing a composition selected from the group

(i) a composition consisting essentially of

(a) from about 50% through about 90%, by weight of the total of (a) and (b) solids, of particulate polymer of hydrocarbon monomers completely substituted with fluorine atoms or a combination of fluorine atoms and chlorine atoms;

(b) from about 10% through about 50%, by weight of the total of (a) and (b) solids, of an ammonia stabilized colloidal silica sol containing about 30% solids and having a pH of 9.6, and

(c) a liquid carrier.

(ii) a. 20–90%, by weight of total solids, a particulate fluorocarbon polymer;

b. 10–80%, by weight of total solids, colloidal silica having a pH of 8.4–9.9 at 25° C., whose particles have a size of 5–100 millimicrons and specific surface area of 125–420 square meters per gram;

c. 1–10%, by weight of total composition, alkyl benzene;

d. 1–10%, by weight of total composition, alcohol containing 4 or more carbon atoms, said alcohol being miscible with water;

e. 0.3–10%, by weight of total composition, fatty acid containing 8 or more carbon atoms;

f. 1–15%, by weight of total composition, amine having the formula

wherein R_1 contains 1 to 6 carbon atoms and may contain other functional groups, and R_2 and R_3 contain one to six carbon atoms or hydrogen; and

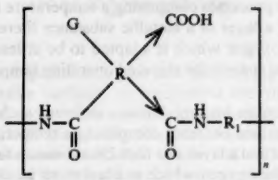
g. a liquid carrier or

(iii) a. about 10%–90%, by weight of the total of (a) and (b) solids, of a particulate polymer of monoethylenically unsaturated hydrocarbon monomers completely substituted with fluorine atoms or a cominbation of fluorine atoms and chlorine atoms, the polymer having a number average molecular weight of at least 20,000;

b. about 10%–90%, by weight of the total of (a) and (b) solids, of a binder which comprises

1. about 5–95%, by weight of the total of (1) and (2) solids, of a colloidal silica which air-dries to form a continuous film when laid down by itself, and

2. about 5–95%, by weight of the total of (1) and (2) solids, of a salt of a polyamide acid represented by the structure



where

G is hydrogen or a carboxyl group; → denotes isomerism;

R is a tetravalent organic radical containing at least two carbon atoms, no more than two carbonyl groups of each polyamide acid unit being attached to any one carbon atom of each tetravalent radical;

R_1 is a divalent radical containing at least two carbon atoms, the amide groups of adjacent polyamide acid units each being attached to separate atoms of said divalent radical; and

n is a number large enough to give the polyamide acid an inherent viscosity of at least 0.1, measured as a 0.5% solution in N,N-dimethylacetamide at 30° C.; neutralized with a stoichiometric amount of a tertiary amine;

c. about 10–90%, by weight of the polyamide acid amide salt, of N-methyl pyrrolidone, dimethyl formamide, dimethylacetamide, dimethylsulfoxide, cresylic acid, sulfolane or formamide; and

d. a liquid carrier or

(iv) a composition comprising particulate fluorocarbon polymer, colloidal silica stabilized with sodium ions, and a liquid carrier; overlaid with

(B) a topcoat obtained by curing a composition comprising

(1) about 25–95%, by weight of the total of (1) and (2) solids, of a particulate fluorocarbon polymer of hydrocarbon monomers completely substituted with fluorine atoms or a combination of fluorine atoms and chlorine atoms,

(2) about 5–75%, by weight of the total of (1) and (2) solids, of a polymer of monoethylenically unsaturated monomers, which polymer depolymerizes, and whose depolymerization products vaporize, in the temperature range of from about 150° C. below the fusion temperature of the fluorocarbon polymer used to about the fluorocarbon polymer's decomposition temperature wherein said polymer contains one or more monoethylenically unsaturated acid units optionally esterified with glycidyl esters of 4–14 carbon atoms (total) and

(3) a liquid carrier, at a temperature at which (B)(2) is depolymerized and at which the depolymerization products vaporize.

4,118,538

FABRIC-PRINTING OR DYEING PROCESS USING THERMOSENSITIZER FOR LATEX BINDER

Jean Balland, Chateaurenault, France, assignor to Manufacture de Produits Chimiques Protex, Societe Anonyme, Paris, France

Filed Jul. 25, 1977, Ser. No. 818,676

Int. Cl.[2] C08L *7/02;* **C08G** *51/24, 51/66*

U.S. Cl. 428—425 **5 Claims**

1. A process for the coloring of textiles which comprises the step of:

treating the textile with a pigment dyestuff in a binding agent in the form of a latex and including a thermosensitizing agent constituted by an alkylene-urethane copolymer, the proportion of the alkylene-urethane copolymer with respect to the quantity of latex being between 2 and 80% by weight; and

heating the treated textile to a temperature sufficient to activate said latex and bond said pigmentary colorant to said fabric.

5. Textile articles made by the process defined in claim 1.

4,118,539

SUPER HARD-HIGHLY PURE SILICON NITRIDES HAVING A PREFERRED CRYSTAL FACE ORIENTATION

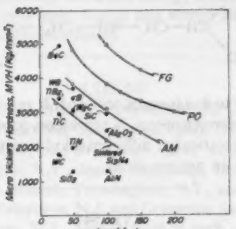
Toshio Hirai, and Koichi Niihara, both of Sendai, Japan, assignors to The Research Institute for Iron, Steel and Other Metals of the Tohoku University, Sendai, Japan

Filed Jan. 3, 1977, Ser. No. 756,282

Claims priority, application Japan, Jan. 13, 1976, 51-2468

Int. Cl.[2] C01B *21/06;* **B01J** *17/32*

U.S. Cl. 428—446 **4 Claims**



1. A super hard, highly pure silicon nitride having a crystal orientation wherein the crystal face (*h k o*) in a hexagonal system is oriented in parallel to the substrate upon which the silicon nitride was deposited, a grain size of not more than 50 μm and a micro Vickers hardness of more than 3,000 Kg/mm^2 under a load of 100 g.

4,118,540

USE OF SILANES HAVING CAPPED FUNCTIONAL GROUPS AS ADHESIVIZING AGENTS

Jürgen Amort, Troisdorf-Sieglar, and Heinz Nestler, Troisdorf-Eschmar, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf Bez. Cologne, Germany

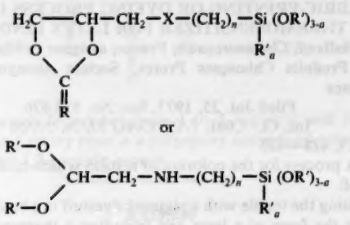
Filed Dec. 30, 1976, Ser. No. 755,876

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559259

Int. Cl.[2] B32B *15/08*

U.S. Cl. 428—447 **13 Claims**

1. A process for protecting the surface of an inorganic oxidic or metallic surface against corrosion or for improving its adhesion to an organic polymeric material which comprises contacting said surface an aqueous solution of a silane having a capped functional group, said silane being one of those having the following formulas:



or

wherein

$n = 1$ to 8,

a can be equal to 0 or 1,

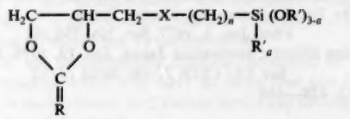
R represents oxygen or 2 hydrogen atoms,

X represents oxygen or sulfur, and

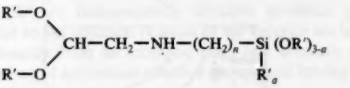
R′ represents identical or different alkyl moieties which can be interrupted in the chain by an oxygen atom,

the silane being applied in the form of a 0.05 to 5.0 weight percent solution and thereafter removing the aqueous solvent.

5. A laminate comprising an inorganic oxidic or metallic surface and a polymer, said laminate having in the region of the interface between the inorganic oxidic or metallic surface and the polymer a silane having a capped functional group said silane being one having the following formulas:



or



wherein $n = 1$ to 8, a is equal to 0 or 1, R represents an oxygen moiety or 2 hydrogen atoms, X represents oxygen or sulfur and R′ represents identical or different alkyl moieties which can be interrupted by an oxygen atom.

4,118,541

RELEASE SHEET OF A COATED CELLULOSE PAPER

George Edward Power, and Donald Louis Bolling, both of Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

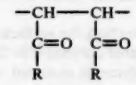
Filed Nov. 3, 1976, Ser. No. 738,505
Int. Cl.² B32B 9/06
U.S. Cl. 428—452 **13 Claims**

1. A release sheet for use in the production of laminates comprising

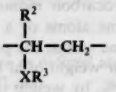
(1) a cellulosic paper sheet coated with a first coating comprising

(A) an oil-modified alkyd resin cross-linked with from about 30 to about 70%, by weight, based on the total weight of (A), of a polyalkylether of a polymethylol melamine and a second coating, atop said (A), comprising

(B) a copolymer containing from about 15 to about 85 mole percent of recurring units having the formula



wherein each R is, individually, OR^1, R^1 being hydrogen or C_1–C_{22} alkyl, or the two R groups taken together form an oxa group, and the remaining units are recurring units of the formula



wherein R^2 is hydrogen or methyl, R^3 is a C_9–C_{30} alkyl radical and X is O or CH_2.

4,118,542

CONTROLLED ATMOSPHERE AND VACUUM PROCESSES

Peter Frank Walter, Swansea, Wales, assignor to Wall Colmonoy Corporation, Detroit, Mich.

Filed Jan. 17, 1977, Ser. No. 764,222
Int. Cl.² B22F 3/00
U.S. Cl. 428—553 **21 Claims**

1. A getter unit for controlled atmosphere and vacuum high temperature processes comprising a temperature resistant rigid support and a layer of a metallic substance thereon having an affinity for oxygen which is adapted to be at least in partially molten liquid state at the elevated operating temperature of the process.

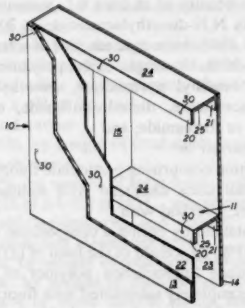
21. A vacuum brazing furnace defining a chamber and a getter unit in said chamber comprising a temperature resistant rigid support and a layer of a metallic substance thereon having an affinity for oxygen which is adapted to be at least in partially molten liquid state at the elevated operating temperature of the furnace.

4,118,543

REFLECTANT FOIL INSULATED STEEL DOORS

Henry Patrick Donohue, Fairview, Pa., assignor to Fenestra, Erie, Pa.

Filed Nov. 16, 1976, Ser. No. 742,088
Int. Cl.² E04C 2/34
U.S. Cl. 428—615 **2 Claims**



1. A door comprising,

a frame, face skins and a metallic aluminum foil sheet having a melting point substantially lower than the melting point of steel,

said frame comprising vertical members and horizontal members including a peripheral frame comprising a top member, a bottom member, a lock side member and a hinge side member,

said face skins comprising generally flat sheets of suitable material thickness generally covering the said frame on each side,

said metallic foil sheet being disposed between the said frame and one of said face skins,

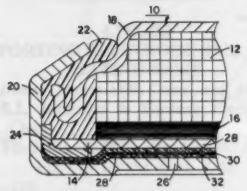
and weld means extending through said metallic foil welding said face skins to said frame.

4,118,544

METAL-AIR DEPOLARIZED CELL HAVING RESTRICTED GAS PASSAGEWAY

Franciszek J. Przybyla, and Michael J. Smith, both of Mississauga, Canada, assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Sep. 28, 1977, Ser. No. 837,477
Int. Cl.² H01M *12/06*
U.S. Cl. 429—27 **10 Claims**



1. In a gas-depolarizable galvanic cell having an anode, a gas-depolarizable cathode, an electrolyte carrying separator therebetween, and a container for said cell having negative and positive terminals electrically insulated from each other and electrically associated with said anode and cathode, respectively, and where there is at least one opening in said container for gas communication from the exterior of the cell to said gas-depolarizable cathode, the improvement wherein:

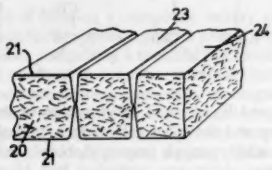
there is placed in the path of said gas communication to said cathode, a non-porous barrier having gas passageway comprising at least one aperture therethrough from one side to the other thereof; and where the total crosssectional area perpendicular to the direction of gas flow of said gas passageway is not greater than the total projected area of the gas passageway through the thickness of said non-porous barrier.

4,118,545

SODIUM SULPHUR CELLS

Ivor Wynn Jones, and Graham Robinson, both of Chester, England, assignors to Chloride Silent Power Limited, London, England

Filed Feb. 15, 1977, Ser. No. 768,929
Claims priority, application United Kingdom, Feb. 18, 1976, 6377/76
Int. Cl.² H01M *10/00*
U.S. Cl. 429—104 **15 Claims**



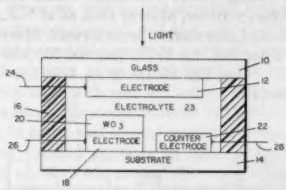
1. In a sodium sulphur cell having a cathodic region between a solid electrolyte and a cathode current collector containing a porous packing to form an electronic conductor; the improvement wherein the packing comprises a first material formed of graphite or carbon or of a material coated with graphite or carbon, intimately mixed with a second material which is chemically inert to sulphur/polysulphides forming the cathodic reactant but which at the operating temperature of the cell is more easily wetted by the polysulphides than is the carbon fibre material.

4,118,546

TRIPLE ELECTRODE PHOTOGALVANIC CELL WITH ENERGY STORAGE CAPABILITY

Horst Witzke, Princeton; Schoen-nan Chen, North Brunswick; Satyendra K. Deb, East Brunswick, all of N.J., and Michael A. Russak, Farmingdale, N.Y., assignors to Optel Corporation, Princeton, N.J. and Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 27, 1977, Ser. No. 763,071
Int. Cl.² H01M *6/30, 6/36*
U.S. Cl. 429—111 **11 Claims**



1. In a photogalvanic cell having an electrolyte contained between separated first electrode and counterelectrode members, the improvement comprising:

a photoactive material contacting the first electrode to form a photoactive site;

charge storage means located in spaced relation to the site in a manner permitting irradiating light to pass to the photoactive site without prior light filtering by the charge storage means;

a second electrode connected to the charge storage means for conducting electrical charge therefrom; and

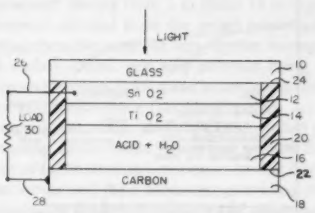
means connected to the electrodes and counterelectrode for drawing converted electrical energy from the cell during irradiation by a light source and stored electrical energy after irradiation terminates.

4,118,547

THIN FILM PHOTOGALVANIC CELL

Horst Witzke, Princeton; Schoen-nan Chen, North Brunswick; Satyendra K. Deb, East Brunswick, all of N.J.; Steven Robert Jost, Huntington, N.Y.; Joseph Reichman, Great Neck, N.Y., and Michael A. Russak, Farmingdale, N.Y., assignors to Optel Corporation, Princeton, N.J. and Grumman Aerospace Corporation, Bethpage, N.Y., part interest to each

Filed Jan. 27, 1977, Ser. No. 763,073
Int. Cl.² H01M *6/30, 6/36*
U.S. Cl. 429—111 **10 Claims**



1. A photogalvanic cell comprising: light transmissive means:

a fluid electrolyte sealed within the cell;

a first electrode positioned in contact with the electrolyte;

a second electrode insulated from the first electrode and spaced therefrom;

means connected to the electrodes for conducting electricity generated by said cell from the cell;

at least one of said electrodes being associated with means enclosing said cell; and

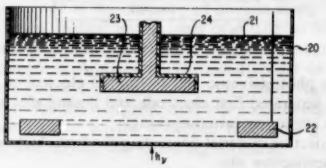
a thin film of TiO_2 contacting the second electrode at a first surface of the thin film, the opposite surface contacting the electrolyte to form a photoactive interface capable of converting light energy to electrical energy.

4,118,548

METHOD OF OPERATING A LIQUID-SEMICONDUCTOR JUNCTION PHOTOCELL

Kuang-Chou Chang, North Plainfield; Adam Heller, Bridgewater, and Barry Miller, Murray Hill, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 18, 1977, Ser. No. 769,950
Int. Cl.² H01M 6/30, 6/36
U.S. Cl. 429—111 **5 Claims**



1. A method of operating a photocell containing a photovoltaic junction between the surface of a semiconductor material and a liquid electrolyte containing a redox couple characterized in that said method comprises:

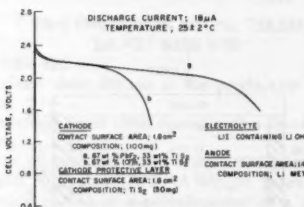
controllably removing said surface of said semiconductor material at a rate of at least 300 Angstroms per day yet maintaining the characteristics of said junction.

4,118,549

SOLID STATE CELL WITH CONDUCTIVE LAYER BETWEEN ELECTRODE AND ELECTROLYTE

Charles Chi Liang, Clarence, N.Y., and AshokVenimadhav Joshi, Levittown, Pa., assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Dec. 6, 1976, Ser. No. 747,678
Int. Cl.² H01M 6/18
U.S. Cl. 429—191 **11 Claims**



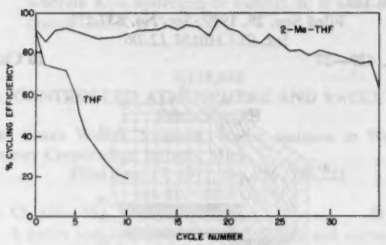
1. A solid electrochemical cell comprising a solid anode and a solid cathode as electrodes, a solid electrolyte chemically reactive with at least one of said electrodes, and a solid layer positioned between said solid electrolyte and said electrode chemically reactive therewith, said solid layer being chemically unreactive with both said solid electrolyte and said electrode which is chemically reactive with said electrolyte, and said layer having an ionic conductivity in excess of 1×10^{-9} $ohm^{-1}\,cm^{-1}$ at room temperature.

4,118,550

APROTIC SOLVENT ELECTROLYTES AND BATTERIES USING SAME

Victor R. Koch, Framingham, Mass., assignor to EIC Corporation, Newton, Mass.

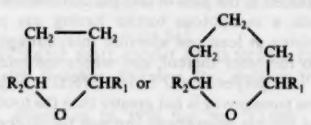
Filed Sep. 26, 1977, Ser. No. 836,731
Int. Cl.² H01M 6/14
U.S. Cl. 429—194 **20 Claims**



2. A rechargeable electrochemical cell comprising:

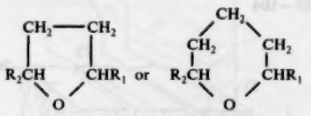
positive and negative electrodes with said negative electrode consisting essentially of lithium as the active electrode materal; and

an electrolyte providing an ionically conductive path between said electrodes, said electrolyte comprising an ionically dissociable lithium salt and a solvent for said salt which is primarily one or more compounds represented by the formula



where R_1 and R_2 are both alkyl groups or one of them is an alkyl group and the other is hydrogen, said alkyl group being a methyl, ethyl, propyl, isopropyl, butyl, isobutyl or tertiary butyl group.

9. An electrolyte for use in an electrochemical cell having a lithium negative electrode, said electrolyte comprising an ionically dissociable solute in the form of a lithium salt and a solvent for said salt which comprises predominantly one or more members from the class consisting of compounds conforming to the formula



where R_1 and R_2 are both alkyl groups or one of them is an alkyl group and the other is hydrogen, said alkyl group being a methyl, ethyl, propyl, isopropyl, butyl, isobutyl or tertiary butyl group.

4,118,551

MERCURY-FREE ZINC ELECTRODE

Roland F. Chireau, Quaker Hill, Conn., and Ronald G. Gunther, Troy, Mich., assignors to Yardney Electric Corporation, Pawcatuck, Conn.

Filed Oct. 31, 1977, Ser. No. 847,357
Int. Cl.² H01M 4/24, 10/24
U.S. Cl. 429—207 **9 Claims**

1. An improved zinc electrode consisting of mercury-free

material, said material comprising a substantially homogeneous admixture of

(1) zinc active electrode material;

(2) water-soluble salt which is selected from the group consisting of lead acetate, cadmium acetate and mixtures thereof, said salt being present in an amount sufficient to substantially reduce the evolution of hydrogen gas at said zinc electrode; and,

(3) water-soluble non-ionic binder which is hydroxy alkyl cellulose, said binder being present in an effective amount to provide a cohesive zinc electrode and to retain said zinc electrode material and acetate substantially homogeneously dispersed in said zinc electrode.

4,118,552
SELF-SUPPORTING ELECTRODE AND METHOD OF MAKING SAME

Roland F. Chireau, Quaker Hill, Conn., and Aldo S. Berchielli, Westerly, R.I., assignors to Yardney Electric Corporation, Pawcatuck, Conn.

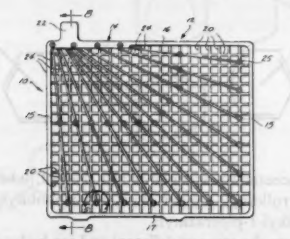
Filed Jan. 5, 1978, Ser. No. 867,056
Int. Cl.[2] H01M *4/04, 4/58*
U.S. Cl. 429—219 **15 Claims**

1. An improved self-supporting electrode, said electrode comprising a substantially uniform cast, solidified mixture of a major proportion by weight of cuprous chloride and a minor proportion by weight silver chloride.

4,118,553
COMPOSITE BATTERY PLATE GRID AND METHOD OF MANUFACTURING

Paul J. Buckethal, Villa Hills, Ky.; Jerome J. Groff, Wauwatosa, Wis.; Vincent M. Halsall, River Hills, Wis., and Roy E. Hennen, Mequon, Wis., assignors to Globe-Union, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 687,166, May 17, 1976, abandoned. This application Jun. 15, 1977, Ser. No. 806,927
Int. Cl.[2] H01M *4/72*
U.S. Cl. 429—234 **36 Claims**



1. The method of forming a composite battery grid having an electrically conductive member and a plastic support, said conductive member comprising a terminal lug having a plurality of divergent conductive runners extending therefrom and said plastic support comprising a generally rectangular boundary within which is a plurality of interconnected spaced runners forming a grid-like structure, comprising the steps of:

providing a first mold half having a pattern formed therein, said first mold half including retractable means placed within one or more portions of said pattern, said retractable means being movable between an extended position and a retracted position, said pattern being in the shape of at least part of a first structure, said first structure being one of said conductive member and said plastic support;

providing a second mold half having a pattern formed therein, said pattern being in the shape of the remainder of said first structure;

placing said first and second mold halves together with said retractable means in an extended position;

introducing a first material in a liquid state into said first and second mold half patterns and allowing said first material to at least partially solidify and form said first structure, said first material being metal if said first structure is said conductive member and being plastic if said first structure is said plastic support;

removing said second mold half while retaining said first material in said first mold half;

placing a third mold half adjacent said first mold half, said third mold half having a pattern which overlies portions of said first mold half pattern including said retractable means, said third mold half pattern being in the shape of a second structure, said second structure being the other of said conductive member and said plastic support;

moving said retractable means to a retracted position to form vacated portions in said first mold half pattern and in communication with said third mold half pattern;

injecting a second flowable material into said third mold half pattern to cause said second material to liquify and flow into said vacated portions to form a mechanical joint between said first and second materials, said second material being plastic if said second structure is said plastic support and being metal if said second structure is said conductive material;

allowing said second material to solidify and form said second structure; and

removing the resulting molded battery grid from said first and third mold halves.

4,118,554
AGGREGATED POLYELECTROLYTES

Joseph E. Fields, Balwin, and Robert J. Slocombe, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 25, 1977, Ser. No. 818,919
Int. Cl.[2] C08F *6/00, 8/32*
U.S. Cl. 526—15 **10 Claims**

1. A method of improving the filterability, drying characteristics and physical form of polymers used in making water-insoluble, cross-linked polyelectrolytes containing amine-imide functional groups without substantially diminishing the protein adsorption capacity of said polyelectrolytes comprising heating said polymer in an inert organic solvent or solvent mixture at a temperature ranging from about 115° C. to about 160° C. but lower than the softening point of said polymer for at least about 15 minutes and until said polymer is substantially aggregated, said polymer comprising a copolymer of (a) unsaturated monomer having from 2 to about 18 carbon atoms and (b) a monomer selected from the group consisting of unsaturated polycarboxylic acids or anhydrides having from 4 to about 12 carbon atoms, and said polymer being thus aggregated prior to the cross-linking and substitution with the major portion of said amine-imide functional groups.

6. An aggregated, water-insoluble, cross-linked polyelectrolyte containing amine-imide functional groups comprising a copolymer of (a) unsaturated monomer having from 2 to about 18 carbon atoms and (b) a monomer providing reactive sites and selected from the group consisting of unsaturated polycarboxylic acid or anhydride having from 4 to about 12 carbon atoms, and in which from about 2 to 100% of the reactive sites in said copolymer are substituted with amine-imide functional groups, said polyelectrolyte being thus aggregated prior to cross-linking and substitution with the major portion of said amine-imide functional groups, the major portion of said aggregated polyelectrolyte copolymer having a particle size ranging from about 50 to about 200 microns, said major portion in both instances being defined to mean more than 50% of the entire portion.

4,118,555

PROCESS FOR THE PREPARATION OF PETROLEUM RESINS

Silvio Vargiu, Casatenovo (Como); Edoardo Carpaneti, Sovico (Milan); Giancarlo Crespolini, Vedano Al Lambro (Milan), and Mario Pitzalis, Arcore (Milan), all of Italy, assignors to Euteco, S.p.A., Milan, Italy

Filed Aug. 5, 1977, Ser. No. 822,172

Claims priority, application Italy, Aug. 5, 1976, 26047 A/76

Int. Cl.[2] C08F *240/00*

U.S. Cl. 526—76 **13 Claims**

1. A process for the preparation of petroleum resins of good solubility in n-hexane, which comprises:

(a) subjecting a hydrocarbon fraction containing olefins and diolefins, having a boiling range of from 30° to 300° C., to prepolymerization at a temperature of from 10° to 60° C. for a period of from 1 to 60 minutes in the presence of from 2 to 10 parts by weight of activated clays for each 100 parts by weight of said hydrocarbon fraction, thereby to transform a portion of said fraction of from 1 to 20% by weight into pre-polymers having a boiling point above 250° C.;

(b) removing said activated clays from the prepolymerization medium;

(c) subjecting the resulting hydrocarbon solution of prepolymers to distillation in such a way as to recover as distillate a selected hydrocarbon fraction having a maximum boiling point of 250° C.;

(d) adding to the said selected hydrocarbon fraction from 0.05 to 1 part by weight of a C_5 hydrocarbon fraction for each part by weight of said selected hydrocarbon fraction, said C_5 hydrocarbon fraction being obtained by steam-cracking of petroleum fractions, having a bromine value of from 90 to 130 and containing unsaturated hydrocarbons with five carbon atoms or a mixture of unsaturated hydrocarbons with an average of five carbon atoms per molecule, and having a boiling range of from 25° to 130° C., and subjecting the resulting mixture to polymerization in the presence of a Friedel-Crafts catalyst with conversion into a petroleum resin of a quantity of from 15 to 50% by weight with respect to said mixture; and

(e) recovering the petroleum resin of step (d) from the resulting polymerization products.

4,118,556

PROCESS FOR THE PRODUCTION OF ACRYLONITRILE-VINYL-CHLORIDE COPOLYMERS WITH IMPROVED WHITENESS

Joachim König, Schildgen, and Carlhans Süling, Odenthal-Hahnenberg, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 606,583, Aug. 21, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 749,779

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1974, 2440259

Int. Cl.[2] C08F *220/44, 4/40*

U.S. Cl. 526—229 **1 Claim**

1. A process for the improvement of the whiteness and thermal stability of highly chemically uniform copolymers consisting essentially of acrylonitrile and vinyl chloride having an acrylonitrile content of from 25 to 60% by weight and a vinyl chloride content of from 40 to 75% by weight consisting essentially of copolymerizing acrylonitrile and vinyl chloride by emulsion polymerization with a redox catalyst of persulphate and compounds of sulphurous acid wherein the polymerization is conducted at a pH of from 2.5 to 4 and the ratio be weight of reducing to oxidizing component is maintained at at least 4:1 to provide an acrylonitrile/vinyl chloride copolymer having an acrylonitrile content of from 25 to 60% by weight and a vinyl chloride content of from 40 to 75% by weight.

4,118,557

CYCLIC ALKYLIDENYL N-(LOWER-ALKYL)-3-(PYRIDINYL)ANILINOMETHYLENEMALONATES

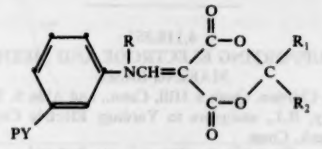
George Y. Lesher, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 675,607, Apr. 9, 1976, abandoned. This application Jul. 28, 1977, Ser. No. 819,693

Int. Cl.[2] C07D *405/12, 319/06*

U.S. Cl. 542—420 **4 Claims**

1. Cyclic alkylidenyl N-(lower-alkyl)-3-PY-anilinomethylenemalonate having the formula



where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, R is lower-alkyl, and R_1 and R_2 are each lower-alkyl.

4,118,558

2-ARYL-6-ARYLIDENE-1-(SUBSTITUTED AMINOALKOXY)-1-CYCLOHEXENES

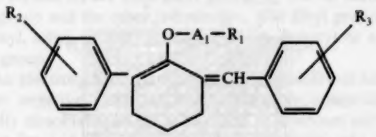
Chester F. Turk, Kendall Park, and John Krapcho, Somerset, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 771,867, Feb. 25, 1977, Pat. No. 4,085,142. This application Jan. 25, 1978, Ser. No. 872,122

Int. Cl.[2] C09B *23/00*

U.S. Cl. 542—429 **9 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

R_1 is 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 1-piperazinyl, 4-alkyl-1-piperazinyl;

R_2 and R_3 are the same or different and are hydrogen, chloro, fluoro, alkyl, alkoxy or trifluoromethyl; and

A_1 is alkylene having 2 to 5 carbon atoms; wherein the terms alkyl and alkoxy refer to groups having 1 to 8 carbon atoms.

4,118,559

9-HYDROXYHEXAHYDRODIBENZO[o,d]PYRANS, 1-SUBSTITUTED-9-HYDROXYHEXAHYDRODIBENZO[b,d]PYRANS AND INTERMEDIATES THEREFOR

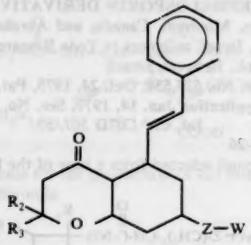
Michael Ross Johnson, and Lawrence Sherman Melvin, Jr., both of Gales Ferry, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Jun. 7, 1977, Ser. No. 804,306

Int. Cl.[2] C07D *311/22, 405/06*

U.S. Cl. 542—432 **11 Claims**

1. A compound having the formula



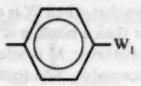
wherein each of R_2 and R_3 is selected from the group consisting of hydrogen and methyl;

Z is selected from the group consisting of

(a) alkylene having from one to 10 carbon atoms;

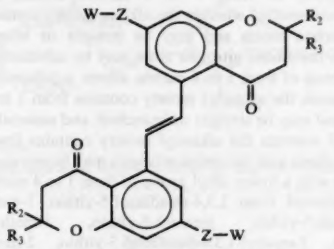
(b) $-(alk_1)_m-O-(alk_2)_n-$ wherein each of (alk_1) and (alk_2) is alkylene having from one to 10 carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than 10; each of *m* and *n* is 0 or1; and

W is selected from the group consisting of hydrogen, pyridyl,



wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro.

2. A compound having the formula



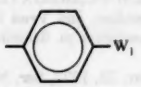
wherein each of R_2 and R_3 is selected from the group consisting of hydrogen and methyl;

Z is selected from the group consisting of

(a) alkylene having from one to 10 carbon atoms;

(b) $-(alk_1)_m-O-(alk_2)_n-$ wherein each of (alk_1) and (alk_2) is alkylene having from one to 10 carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than 10; each of *m* and *n* is 0 or 1; and

W is selected from the group consisting of hydrogen, pyridyl,



wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro.

4,118,560

SUBSTITUTED 1,4-BIS-STYRYLBENZENE AND 4,4'-BIS STYRYLBIPHENYL AND THEIR USE AS OPTICAL BRIGHTNERS

Kurt Weber, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

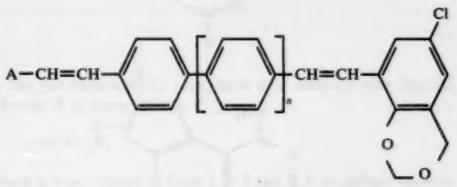
Filed Nov. 11, 1976, Ser. No. 740,706

Claims priority, application Switzerland, Nov. 24, 1975, 15198/75

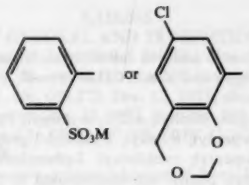
Int. Cl.[2] C07D *319/08*

U.S. Cl. 542—447 10 Claims

1. Distyryl compounds of the formula

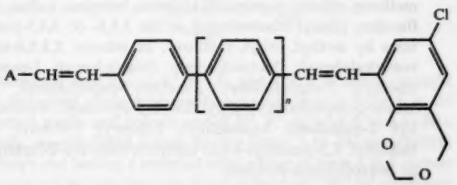


wherein A represents a radical of the formula

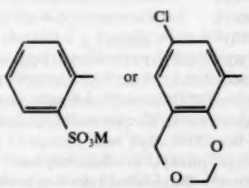


and *n* is 0 or 1, whilst M represents a hydrogen atom or a salt-forming cation.

7. A process for optically brightening organic materials, which comprises incorporating in or applying to these materials an effective amount of a compound of the formula



wherein A represents a radical of the formula



and *n* is 0 or 1, whilst M represents a hydrogen atom or a salt-forming cation.

4,118,561
7-(SUBSTITUTED)-7H-PYRROLO[3,2-F]QUINAZOLINE-1,3-DIAMINES

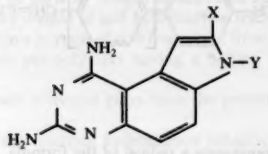
Kurt W. Ledig, Philadelphia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 784,987, Apr. 6, 1977, which is a continuation-in-part of Ser. No. 704,001, Jul. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 704,002, Jul. 9, 1976, abandoned. This application Jun. 27, 1977, Ser. No. 810,659

Int. Cl.[2] C07D *239/95, 487/04*

U.S. Cl. 542—470 110 Claims

1. A compound of the general formula:



or a non-toxic acid addition salt thereof, wherein:

(a) X is hydrogen and Y is $—CH_2R$ or $—R^1$

wherein:

R is hydrogen; methyl; ethyl; n-propyl; i-propyl; n-butyl; i-butyl; n-pentyl; n-hexyl; 2-methyl-1-propenyl; cyclobutyl; cyclopentyl; cyclohexyl; 2-phenylethyl; 2-phenylvinyl; phenyl; phenyl monosubstituted in the 2-, 3-, or 4-position by chlorine, bromine, iodine, fluorine, trifluoromethyl, methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, t-butyl, methoxy, ethoxy, n-propoxy, trifluoromethoxy, cyano, methylsulfonyl, acetyl, propionyl, methylthio, ethylthio, carbethoxy, carboxyl, sodium carboxy, or potassium carboxy; phenyl monosubstituted in the 3-position by amino or nitro; phenyl disubstituted in the 2,3-, 2,4-, 2,5-, 2,6-, 3,4-, or 3,5-positions by methyl, ethyl, n-propyl, methoxy, ethoxy, n-propoxy, chlorine, bromine, iodine, or fluorine; phenyl trisubstituted in the 2,4,6- or 3,4,5-positions by methyl, ethyl, methoxy, or ethoxy; 2,3,5,6-tetramethylphenyl; 3,4-(methylene dioxy)phenyl; 1-naphthalenyl; 2-naphthalenyl; 2-methyl-1-naphthalenyl; 1-bromo-2-naphthalenyl; 2-pyridinyl; 3-pyridinyl; 4-pyridinyl; 2-quinolinyl; 8-quinolinyl; 2-thienyl; 3-thienyl; 4-thiazolyl; 3,5-dimethyl-4-isoxazolyl; tetrahydro-2-furanyl; or benzo[b]thien-3-yl; and

R^1 is hydrogen; phenyl monosubstituted in the 2- or 4-position by amino, nitro, cyano, acetyl, propionyl, methylsulfonyl, trifluoromethyl, or carbethoxy; 2,4-dinitrophenyl; 2,4-diaminophenyl; 2-cyano-4-nitrophenyl; 2-cyano-4-aminophenyl; 3-methyl-4-nitrophenyl; 3-methyl-4-aminophenyl; 2-trifluoromethyl-4-nitrophenyl; 2-trifluoromethyl-4-aminophenyl; 2-thiazolyl; 2-pyridinyl; 5-nitro-2-pyridinyl; 2-pyrimidinyl; 2-pyrazinyl; 2-quinolinyl; 4-quinolinyl; 4-methyl-2-quinolinyl; 7-chloro-4-quinolinyl; 7-trifluoromethyl-4-quinolinyl; 2-methyl-4-quinolinyl; 3-methyl-2-quinoxalinyl; 2-phenyl-4-quinolinyl; or 2-benzothiazolyl; and

(b) X is methyl, phenyl, or chlorine; and Y is hydrogen, methyl, benzyl, 3-cyanobenzyl, 4-cyanobenzyl, or 2,5-dimethylbenzyl; provided that when X is phenyl, Y may only be hydrogen or methyl, and when X is chlorine, Y may only be benzyl.

4,118,562
AZIDOMETHYLARYL-SUBSTITUTED CEPHALOSPORIN DERIVATIVES

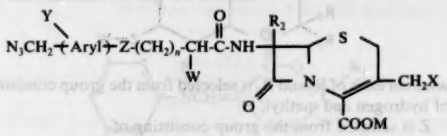
Fortuna Haviv, Montreal, Canada, and Abraham Patchornik, Ness-Ziona, Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Division of Ser. No. 625,558, Oct. 24, 1975, Pat. No. 4,045,438. This application Jan. 14, 1977, Ser. No. 759,470

Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—26 36 Claims

1. A compound selected from a base of the formula:



wherein Aryl is selected from phenyl and 2-thienyl; Y is selected from hydrogen, chlorine, bromine, a straight or branched lower alkyl group of from 1 to 4 carbon atoms and a lower alkoxy group of from 1 to 4 carbon atoms with the proviso that when Aryl is 2-thienyl, Y is hydrogen; Z is selected from a bond, oxygen, sulfur and imino with the proviso that when Aryl is 2-thienyl, Z is a bond; W is selected from hydrogen, methyl, amino, hydroxy, SO_3H and $COOR_1$ wherein R_1 is selected from hydrogen and 5-indanyl; *n* is zero, 1 or 2 with the proviso that when W is other than hydrogen or methyl and Z is other than a bond, *n* is not zero; R_2 is selected from hydrogen, and methoxy; M is selected from hydrogen; a pharmaceutically acceptable non-toxic cation; alkanoyloxymethyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched; alkanoylaminomethyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched and wherein the amino nitrogen atom may be substituted with an alkyl group of from 1 to 4 carbon atoms; alkoxycarbonylaminomethyl wherein the alkoxy moiety contains from 1 to 4 carbon atoms and may be straight or branched and wherein the amino nitrogen atom may be substituted with an alkyl group of from 1 to 4 carbon atoms; *p*-(alkanoyloxy)benzyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched; and aminoalkanoyloxymethyl wherein the alkanoyl moiety contains from 2 to 15 carbon atoms and the amino nitrogen may be mono- or di-substituted with a lower alkyl group of from 1 to 4 carbon atoms; X is selected from 1,3,4-thiadiazol-5-ylthio, 3-methyl-1,2,4-thiadiazol-5-ylthio, tetrazol-5-ylthio, 1-methyltetrazol-5-ylthio, 2-methyl-1,3,4-oxadiazol-5-ylthio, 2-methyl-1,3,4-thiadiazol-5-ylthio and 1,2,3-triazol-5-ylthio; and pharmaceutically acceptable salts thereof.

4,118,563
PRODUCTION OF 7-(2-AMINOMETHYLPHENYLACETAMIDO-3-(1-CARBOXYMETHYLTETRAZOL-5-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACID

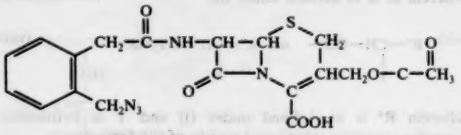
Gary M. F. Lim, Candiac, and Yvon G. Perron, St-Lambert, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,457

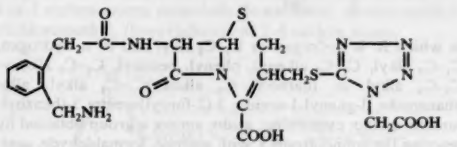
Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—26 4 Claims

1. The acid having the formula

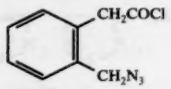


3. In the process for the production of the final cephalosporin having the formula

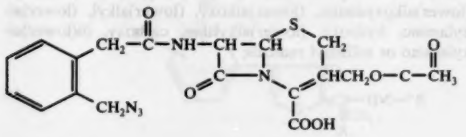


the consecutive steps of

(a) mixing 7-aminocephalosporanic acid or a salt thereof with the acid chloride having the formula

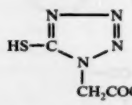


to produce the acid having the formula

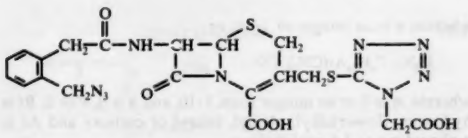


and then

(b) mixing said acid with the thiol having the formula



as the disodium salt thereof to produce the compound of the formula



and then

(c) shaking a solution of said compound with hydrogen under pressure in the presence of Raney nickel to produce the final cephalosporin.

4,118,564

3-6 BIS(MORPHOLINOALKYLTHIO)-PYRIDAZINES

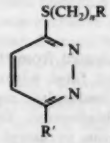
Joseph E. Dunbar, and Louis E. Begin, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 684,224, May 7, 1976, Pat. No. 4,058,520. This application Jul. 22, 1977, Ser. No. 817,935

Int. Cl.[2] C07D *413/14*

U.S. Cl. 544—82 **2 Claims**

1. A compound corresponding to the formula



or the pharmaceutically acceptable acid addition salts thereof wherein R is morpholinyl; R′ is

$$-S(CH_2)_nR;$$

where *n* is an integer of from 1 to 5 and R is as defined hereinbefore.

4,118,565

ACETALS OF GLYOXAL AND TEREPHTHALDEHYDE

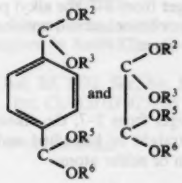
Gerhard Wolfgang Helmut Scherf, Dundas, Canada, assignor to Canadian D. A. Stuart Oil Co. Limited, Scarborough, Canada

Division of Ser. No. 640,273, Dec. 12, 1975, abandoned. This application Jan. 13, 1977, Ser. No. 759,189

Int. Cl.[2] C07D *295/08*; C07C *43/30*

U.S. Cl. 544—87 **4 Claims**

1. A surface active compound selected from the group consisting of



wherein at least one of R^2, R^3, R_5 and R^6 is a lipophilic straight or branched chain hydrocarbon group having from 8 to 24 carbon atoms and at least one of R^2, R^3, R^5 and R^6 is a hydrophilic oxyalkylated group having from 1 to 24 oxyalkylene groups and having a terminal alkyl group of from 1 to 4 carbon atoms or a morpholine group and wherein R^2, R^3, R^5 and R^6 are selected from the group consisting of said lipophilic group and said hydrophilic oxyalkylated group.

4,118,566

$\Delta^{2,3}$-1,4-MORPHOLINE-2-CARBOXYLIC ACID DERIVATIVES AS ANTIBACTERIAL AGENTS

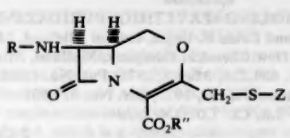
Donald E. Horning, Candiac; Leeson R. Morris, Calgary, and James L. Douglas, Montreal, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 598,461, Jul. 23, 1975, Pat. No. 4,013,648. This application Jan. 27, 1977, Ser. No. 763,454

Int. Cl.[2] C07D *265/36, 498/02*; A01N *9/00, 9/22*

U.S. Cl. 544—105 **59 Claims**

1. A compound having the formula



wherein R is an acyl group of the formula

$$R^aC_nH_{2n}CO— \quad (i)$$

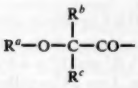
wherein R^a is (a) aryl selected from the group consisting of phenyl, 2-thienyl, 3-thienyl, furyl, 4-isoxazolyl, pyridyl, tetrazolyl, sydnone-3 or -4, imidazolyl, naphthoyl, quinoxalinyl, triazolyl, isothiazolyl, thiadiazolyl, thiazolyl, oxazolyl, oxadiazolyl, pyrazolyl, furazan, pyrazinyl, pyrimidinyl, pyridazinyl and triazinyl; (b) substituted aryl in which the aryl groups defined above under (a) are substituted by one or more chloro, bromo, iodo, fluoro, nitro, amino, cyano, (lower)alkanoyloxy, (lower)alkanoyl, (lower)alkoxyamino, (lower)alkoxy, (lower-)alkyl, (lower)alkylamino, hydroxy, guanidino, (lower)alkylthio, carboxy, phenyl, halophenyl, trifluoromethyl, di(lower)alkylamino, sulfamyl, (lower)alkanoylamino, phenyl(lower)alkylamido, cycloalkylamino, allylamido, morpholinocarbonyl, pyrrolidinocarbonyl, piperidinocarbonyl, tetrahydropyridino, furfurylamido or N-alkyl-N-anilino radicals; (c) C_3–C_{12} cycloalkyl; (d) substituted C_3–C_{12} cycloalkyl in which the substitutents are one or more chloro, bromo, fluoro, iodo, nitro, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkylamino, C_1–C_2 alkoxy or amino radicals; (e) C_3–C_{12} cycloalkenyl, said cycloalkenyl group having 1 or 2 double bonds; or (f) substituted C_3–C_{12} cycloalkenyl, said cycloalkenyl group having 1 or 2 double bonds and being substituted by one or more chloro, bromo, fluoro, iodo, nitro, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkylamino, C_1–C_2 alkoxy or amino radicals; and n is an integer from 1–4;

$$C_nH_{2n+1}CO— \quad (ii)$$

wherein n is an integer from 1–7, the alkyl portion of said acyl group being straight or branched and optionally interrupted by an oxygen or sulfur atom;

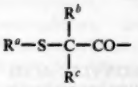
$$C_nH_{2n-1}CO— \quad (iii)$$

wherein n is an integer from 2–7, the alkenyl portion of said acyl group being straight or branched and optionally interrupted by an oxygen or sulfur atom;



(iv)

wherein R^a is as defined above under (i) and in addition may be benzyl, C_1–C_6 alkyl or (lower)alkoxy carbonyl and R^b and R^c which may be the same or different each represent hydrogen, phenyl, benzyl, phenethyl or C_1–C_6 alkyl;



(v)

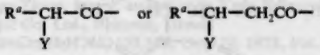
wherein R^a is as defined above under (i) and in addition may be benzyl or C_1–C_6 alkyl and R^b and R^c are as defined under (iv);

$$R^aX(CH_2)_mCO— \quad (vi)$$

wherein R^a is as defined under (i) and in addition may be benzyl; X is oxygen or sulfur; and m is an integer of 2–5;

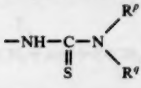
$$R^aCO— \quad (vii)$$

wherein R^a is as defined under (i);

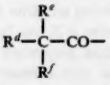


(viii)

wherein R^a is as defined under (i) and Y is hydrazino, guanidino, ureido; substituted ureido of the formula

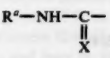


in which R^p is hydrogen or C_1–C_8 alkyl and R^q is hydrogen, C_1–C_8 alkyl, C_2–C_8 alkenyl, phenyl, benzoyl, C_1–C_8 alkoxy-C_1–C_8 alkyl or (carbo-C_1–C_8 alkoxy)C_1–C_8 alkyl; allophanamido; 3-guanyl-1-ureido; 3-(2-furoyl)ureido; 3-(benzoyl-)ureido; cyano; cyanamino; azido; amino; a group obtained by reacting the amino group Y with acetone, formaldehyde, acetaldehyde, butyraldehyde, acetylacetone, methyl acetoacetate, benzaldehyde, salicylaldehyde, methyl ethyl ketone or ethyl acetoacetate; hydroxy; (lower)alkoxy; carboxy; 5-indanyloxycarbonyl; triazolyl; tetrazolyl; halogeno; formyloxy; (lower-)alkanoyloxy; sulfo; or sulfoamino;



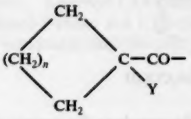
(ix)

wherein R^d, R^e and R^f which may be the same or different may each represent C_1–C_6 alkyl, phenyl or phenyl substituted by one or more chloro, bromo, iodo, fluoro, trifluoromethyl, nitro, amino, cyano, (lower)alkanoyloxy, (lower)alkanoyl, (lower)alkoxyamino, (lower)alkoxy, (lower)alkyl, (lower)alkylamino, hydroxy, (lower)alkylthio, carboxy, di(lower)alkylamino or sulfamyl radicals;



(x)

wherein R^a is as defined under (i) and in addition may be hydrogen, C_1–C_6 alkyl, halogen-substituted C_1–C_6 alkyl, phenethyl, phenoxymethyl, benzyl or R^a—CO— and X is oxygen or sulfur;



(xi)

wherein Y is as defined under (viii) and n is an integer of 1–4;

$$R^gCH(NH_2)(CH_2)_nCO— \quad (xii)$$

wherein n is an integer of 1–10, or

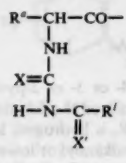
$$H_2N—C_nH_{2n}Ar(CH_2)_mCO—$$

wherein m is 0 or an integer from 1–10, and n is 0, 1 or 2; R^g is hydrogen, (lower)alkyl, phenyl, benzyl or carboxy and Ar is p-phenylene or 1,4-naphthylene;

$$R^hCO.CO— \quad (xiii)$$

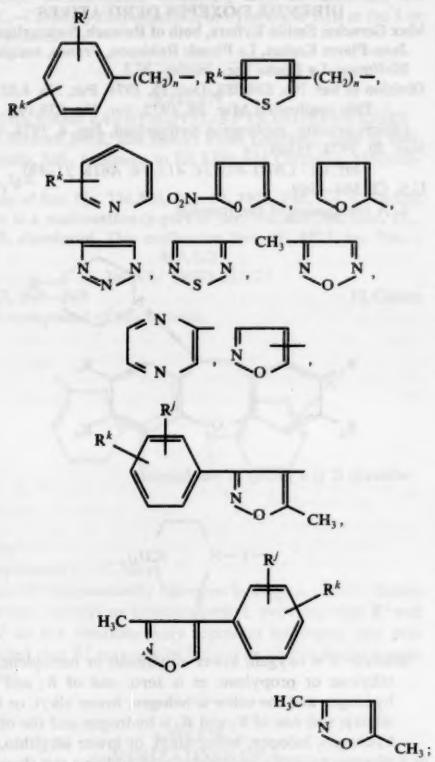
wherein R^h is 2-thienyl; 3-thienyl; α-naphthyl; 2-phenanthryl or a mono-, di- or tri-substituted phenyl group, the substituents

being chloro, bromo, iodo, fluoro, amino, di(lower)alkylamino, (lower)alkyl, (lower)alkoxy, nitro or (lower)alkanoylamino;

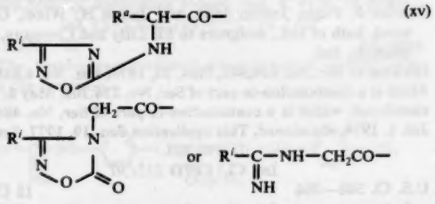


(xiv)

wherein R^a is as defined under (i); X is oxygen or sulfur; X' is oxygen or imino; and R^j is (lower)alkyl, cycloalkyl having 4, 5, 6 or 7 carbon atoms, monohalo (lower)alkyl, dichloromethyl, trichloromethyl, (lower)alkenyl of 2–6 carbon atoms,

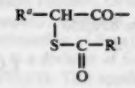


n is an integer from 0 to 3 inclusive and each of R^k and R^j is hydrogen, nitro, di(lower)alkylamino, (lower)alkanoylamino, (lower)alkanoyloxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, sulfamyl, chloro, iodo, bromo, fluoro, or trifluoromethyl;



(xv)

wherein R^a is as defined under (i) and R^j is as defined under (xiv); or



(xvi)

wherein R^a is as defined under (i) and R^1 is (lower)alkyl, cycloalkyl of 3–12 carbon atoms, phenyl, a monocyclic heterocyclic radical having 5 or 6 atoms exclusive of hydrogen which are C, S, N or O, no more than 2 atoms being other than C, or a substituted monocyclic heterocyclic radical as defined above having one or more halo, (lower)alkyl, (lower)alkoxy or phenyl substituents, Z represents a 5- or 6-membered heterocyclic ring containing N, O or S, said heterocyclic ring being optionally substituted by halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, cyano, carboxyl, amino, nitro, C_3–C_4 cycloalkyl, C_2–C_4 alkenyl, trifluoromethyl, hydroxy, hydroxymethyl, C_1–C_4 alkylthio, C_1–C_4 alkylamino, di(C_1–C_4 alkyl)amino, mercapto, phenyl, benzyl, alkoxyalkyl of up to 4 carbons or $-(CH_2)_n$COOH in which *n* is an integer of 1 to 4 and R'' is hydrogen or an easily cleavable ester selected from the group consisting of benzhydryl, benzyl, p-nitrobenzyl, p-methoxybenzyl, trichloroethyl, trimethylsilyl, phenacyl, acetonyl, (lower)alkyl, triphenylmethyl, methoxymethyl, indanyl, phthalidyl, pivaloyloxymethyl and acetoxymethyl, or a pharmaceutically acceptable salt thereof.

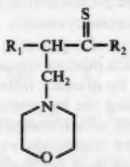
4,118,567

3-MORPHOLINO-2-HETEROCYCLIC-THIOPROPANAMIDES

L. Martin Brenner, Upper Darby, and Bernard Loev, Broomall, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Jun. 23, 1972, Ser. No. 265,941
Int. Cl.[2] C07D *413/06*
U.S. Cl. 544—131 **4 Claims**

1. A compound of the formula:



in which:
R_1 is 2-pyridyl;
R_2 is

or NH—$(CH_2)_n$—cycloalkyl, said cycloalkyl having 3 to 6 carbon atoms;
R_3 and R_4 are hydrogen or lower alkyl and
n is 0 or 1
or a pharmaceutically acceptable acid addition salt thereof.

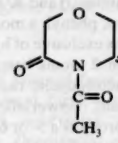
4,118,568

N-ACETYL DIGLYCOLIMIDE

John N. Rapko, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 2, 1977, Ser. No. 830,250
Int. Cl.[2] C07D *265/32*
U.S. Cl. 544—173 **1 Claim**

1. The compound of the formula:



4,118,569

CHLOROISOCYANURATE COMPOUNDS

Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jul. 19, 1976, Ser. No. 706,275
Int. Cl.[2] C07D *251/36*
U.S. Cl. 544—190 **14 Claims**

1. A process for preparing a crystalline, potassium-containing chloroisocyanurate complex compound selected from the group consisting of {(mono-trichloro,) tetra-(monopotassium dichloro,)} penta-isocyanurate tetrahydrate, hydrated (monotrichloro,) (monopotassium dichloro,) di-isocyanurate, said di-isocyanurate having from about 0.1 to about 1.0 moles of water of hydration, and mixtures thereof, which comprises bringing together and reacting in a substantially dry state, trichloroisocyanuric acid and potassium dichloroisocyanurate monohydrate, in amounts such that the molar ratio of said acid to said monohydrate is in the range of 1:0.5 to 1:5.

4,118,570

PROCESS FOR PRODUCING SODIUM DICHLOROISOCYANURATE

James P. Brennan, Wallingford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 31, 1977, Ser. No. 783,241
Int. Cl.[2] C07D *251/32, 251/36*
U.S. Cl. 544—190 **12 Claims**

1. In a process for the production of sodium dichloroisocyanurate wherein trichloroisocyanurate, cyanuric acid and sodium hydroxide are reacted together in an aqueous solution to form an aqueous reaction mixture containing sodium dichloroisocyanurate and the by-product nitrogen trichloride and a gaseous phase containing the by-product nitrogen trichloride vapor; the improvement which comprises:

purging said nitrogen trichloride vapor from said gaseous phase by passing an inert gas through said gaseous phase during said reaction.

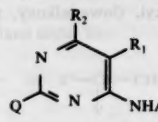
4,118,571

4-ACYLAMINO-2-(PYRIDINYL)PYRIMIDINE DERIVATIVES

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 765,234, Feb. 3, 1977, which is a division of Ser. No. 708,195, Jul. 23, 1976, Pat. No. 4,032,523, which is a division of Ser. No. 555,067, Mar. 3, 1975, Pat. No. 4,018,770. This application Nov. 30, 1977, Ser. No. 856,123
Int. Cl.[2] C07D *401/04*
U.S. Cl. 544—319 **1 Claim**

1. A compound of the formula



where Q is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents or N-oxide thereof, R_1 is hydrogen, lower-alkyl or cyano, R_2 is hydrogen, lower-alkyl, hydroxy or halo, and Ac is lower-alkanoyl or lower-carbalkoxy.

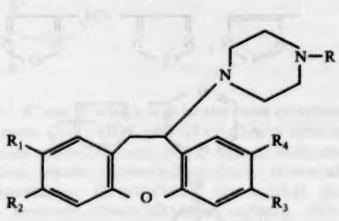
4,118,572

DIBENZ(B,F)OXEPIN DERIVATIVES

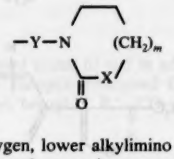
Max Gerecke; Emilio Kyburz, both of Reinach, Switzerland, and Jean-Pierre Kaplan, Le Plessis Robinson, France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 534,033, Dec. 18, 1974, Pat. No. 4,032,525. This application Mar. 18, 1977, Ser. No. 779,198
Claims priority, application Switzerland, Jan. 4, 1974, 62/74; Nov. 20, 1974, 15369/74
Int. Cl.[2] C07D *405/14, 413/14;* A61K *31/495*
U.S. Cl. 544—369 **7 Claims**

1. A compound of the formula



wherein R is a group of the formula



wherein X is oxygen, lower alkylimino or methylene, Y is ethylene or propylene; m is zero; one of R_1 and R_2 is hydrogen and the other is halogen, lower alkyl, or lower alkoxy; and one of R_3 and R_4 is hydrogen and the other is hydrogen, halogen, lower alkyl, or lower alkylthio,

or a pharmaceutically acceptable acid addition salt thereof.

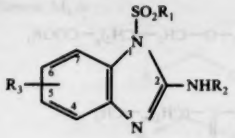
4,118,573

SUBSTITUTED 1-SULFONYLBENZIMIDAZOLES

Charles J. Paget, Indianapolis, and James H. Wikel, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 634,942, Nov. 24, 1975, Pat. No. 4,018,790, which is a continuation-in-part of Ser. No. 574,202, May 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 484,841, Jul. 1, 1974, abandoned. This application Jan. 19, 1977, Ser. No. 760,803
Int. Cl.[2] C07D *235/30*
U.S. Cl. 548—306 **15 Claims**

1. A compound of the formula



wherein R_1 is C_1–C_5 alkyl, C_3–C_7 cycloalkyl, phenyl, furyl, or thienyl;

R_2 is hydrogen, formyl, acetyl or propionyl;

R_3 is C_1–C_8 alkoxycarbonyl, allyloxycarbonyl, propargyloxycarbonyl, (C_3–C_7 cycloalkyl)oxycarbonyl, (C_3–C_7 cycloalkyl)methyloxycarbonyl, 1-(C_3–C_7 cycloalkyl)ethyloxycarbonyl, benzyloxycarbonyl, α-methylbenzyloxycarbonyl, phenoxycarbonyl, hydrazinocarbonyl, carboxy, carboxamido, N-(C_1–C_4 alkyl)carboxamido, N-(C_1–C_4 alkoxy)carboxamido, or cyano; and R_3 is at the 5 or 6 position.

4,118,574

HERBICIDAL 1,4-DIPHENYL-3-PYRAZOLIN-5-ONES

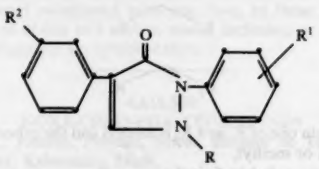
James Richard Beck, and Robert Peter Gajewski, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 724,502, Sep. 20, 1976, Pat. No. 4,075,033, which is a continuation-in-part of Ser. No. 639,744, Dec. 11, 1975, abandoned. This application Nov. 10, 1977, Ser. No. 850,323

Int. Cl.² C07D *231/22*

U.S. Cl. 548—363 **11 Claims**

1. A compound of the formula



wherein

R represents C_1–C_3 alkyl;

R^1 and R^2 independently represent hydrogen, chloro, fluoro, bromo, methyl or trifluoromethyl, provided that R^1 and R^2 do not simultaneously represent hydrogen; and provided that R^1 may not be bromo or chloro in the 4-position.

4,118,575

DERIVATIVES OF PARA-GUANIDINO-L-PHENYLALANINE AND METHODS OF PREPARING THEM

Meir Rigbi; Yakir Klausner, both of Jerusalem, Israel; Pierre Lefrancier, and Edgar Sache, both of Bures s, Yvette, France, assignors to Choay S.A., Paris, France

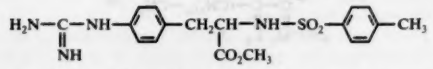
Filed Sep. 5, 1975, Ser. No. 610,671

Claims priority, application France, Sep. 9, 1974, 74 30509

Int. Cl.² C07C *149/40;* C12K *1/04*

U.S. Cl. 560—13 **3 Claims**

1. The tosyl-paraguanidino-L-phenylalanine methyl ester having the formula:



4,118,576

2,4-DICHLOROPHENOXYACETYL CARBAMATE HYDRAZIDES USEFUL AS HERBICIDES

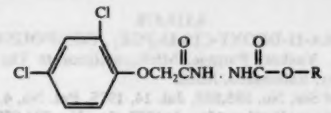
Llewellyn Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 682,923, May 4, 1976, abandoned, which is a division of Ser. No. 639,314, Dec. 10, 1975, Pat. No. 3,975,419. This application Sep. 8, 1977, Ser. No. 831,584

Int. Cl.² C07C *125/06;* A01N *9/24*

U.S. Cl. 560—29 **9 Claims**

1. A compound having the general structural formula



wherein R is selected from the group consisting of alkyl containing 1 through 8 carbon atoms, halosubstituted alkyl containing 1 through 8 carbon atoms, phenyl, benzyl and halosubstituted phenyl.

4,118,577

4,5,6-TRINOR-3,7-INTER-M-PHENYLENE PROSTAGLANDIN A_1 ANALOGS

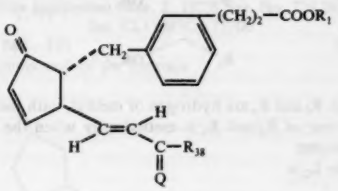
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 677,874, Apr. 19, 1976, abandoned, which is a division of Ser. No. 604,158, Aug. 13, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,359

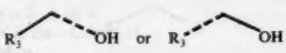
Int. Cl.² C07C *177/00*

U.S. Cl. 560—53 **26 Claims**

1. An optically active compound of the formula

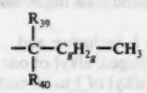


or a mixture comprising that compound and the enantiomer thereof, wherein Q is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the pharmacologically acceptable salts thereof when R_1 is hydrogen; wherein R_{38} is



wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $—CR_{39}R_{40}—$ and terminal methyl, wherein R_{39} and R_{40} are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro,

being the same or different, with the proviso that one of R_{39} and R_{40} is fluoro only when the other is hydrogen or fluoro.

4,118,578

5-OXA-11-DEOXY-CIS-13-PGE$_1$, COMPOUNDS

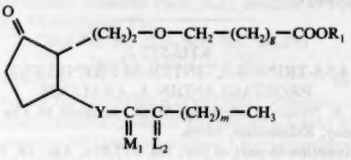
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application Mar. 3, 1977, Ser. No. 774,079

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 560—121 **22 Claims**

1. A compound of the formula



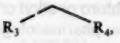
wherein *g* is 2, 3, or 4;
wherein Y is cis—CH=CH—;
wherein M_1 is

or

wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_2 is

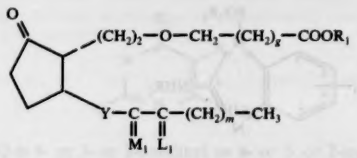
or a mixture of

and

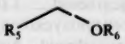


wherein one of R_3 and R_4 is fluoro and the other is hydrogen or fluoro;
wherein *m* is 1 to 5, inclusive; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

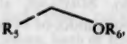
12. A compound of the formula



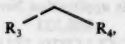
wherein *g* is 2, 3, or 4;
wherein Y is cis-CH=CH—;
wherein M_1 is



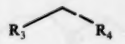
or



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of



and

wherein one of R_3 and R_4 is methyl and the other is hydrogen or methyl;
wherein *m* is 1 to 5, inclusive; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,118,579

5-OXA-11-DEOXY-CIS-13-PGF$_{1\alpha}$ COMPOUNDS

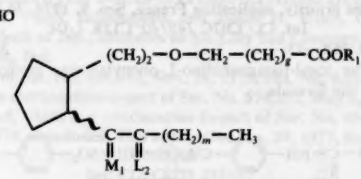
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application Mar. 3, 1977, Ser. No. 774,080

Int. Cl.^{2} C07C *177/00*

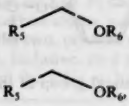
U.S. Cl. 560—121 **21 Claims**

1. A compound of the formula

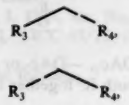


wherein *g* is 2, 3, or 4;

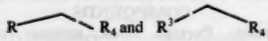
wherein Y is cis—CH=CH—;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_2 is



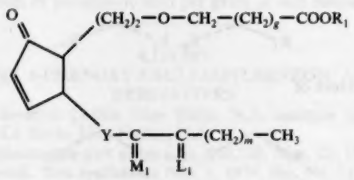
or a mixture of



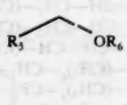
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that at least one of R_3 and R_4 is methyl or fluoro and that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein *m* is 1 to 5, inclusive; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,118,580
5-OXA-CIS-13-PGA, COMPOUNDS
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application Mar. 3, 1977, Ser. No. 774,081
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—121 **25 Claims**

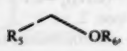
1. A compound of the formula



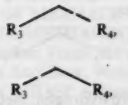
wherein *g* is 2, 3, or 4;
wherein Y is cis—CH=CH—;
wherein M_1 is



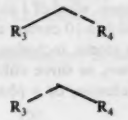
or



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of

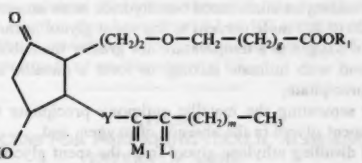


and

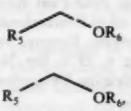
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein m is one to 5, inclusive; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,118,581
5-OXA-CIS-13-PGE$_1$ COMPOUNDS
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application Mar. 3, 1977, Ser. No. 774,083
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—121 **25 Claims**

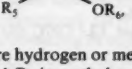
1. A compound of the formula



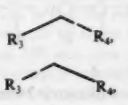
wherein *g* is 2, 3, or 4;
wherein Y is cis—CH=CH—;
wherein M_1 is



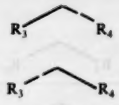
or



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of



and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein m is 1 to 5, inclusive; and

wherein R_1 is hydrogen, alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,118,582

PURIFICATION OF SPENT ETHYLENE GLYCOL

Charles Carey Walker, Circleville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 626,027, Oct. 28, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 764,901

Int. Cl.[2] C07C *69/76, 29/24*

U.S. Cl. 560—96 **12 Claims**

1. In a process for the recovery of ethylene glycol from spent glycol formed in the manufacture of polyethylene terephthalate wherein terephthalic acid or a lower alkyl ester thereof and ethylene glycol are reacted to form dihydroxyethyl terephthalate, said dihydroxyethyl terephthalate is polymerized in the presence of an antimony oxide catalyst to form said polyethylene terephthalate and spent glycol containing antimony catalyst residues, and ethylene glycol is recovered by distillation from the spent glycol, the improvement comprising:

(a) adjusting the pH of the spent glycol to about 2 to 7;

(b) adding an alkali metal borohydride in an excess of about 20 to 200 mole percent to the spent glycol in the absence of oxygen at a temperature not greater than about 60° C. and with intimate mixing, to form a metallic antimony precipitate;

(c) separating the metallic antimony precipitate from the spent glycol in the absence of oxygen; and

(d) distilling ethylene glycol from the spent glycol.

4,118,583

MIXED ESTERS OF POLYOLS

Pierre Baudet, Genéva; Jean-Paul Ricard, and Adrian Schulthess, both of Vaud, all of Switzerland, assignors to Laboratories om Societe Anonyme, Geneva, Switzerland

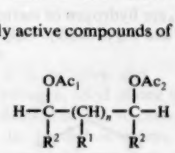
Filed Dec. 6, 1976, Ser. No. 747,567

Claims priority, application Switzerland, Jan. 8, 1976, 173/76; Jul. 30, 1976, 9790/76

Int. Cl.[2] C07C *69/76*

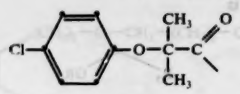
U.S. Cl. 560—63 **7 Claims**

1. Therapeutically active compounds of the general formula:

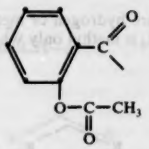


wherein n is 0, 1, 2, 3 or 4;

Ac_1 is the 2-p-chloro-phenoxy-2-methylpropionyl or clofibril group of the formula:



Ac_2 is the 2-acetylsalicyl group of the formula:



R_1 is hydrogen, $—OAc_1$, $—OAc_2$ or $—OSO_3H$, and R_2 is hydrogen or both R^2 together form a single bond.

4,118,584

9-DEOXY-9-METHYLENE-16-PHENYL-PGF COMPOUNDS

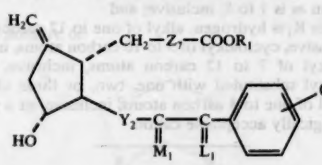
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 11, 1977, Ser. No. 786,249

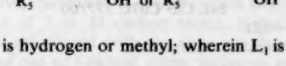
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—55 **131 Claims**

1. A prostaglandin analog of the formula

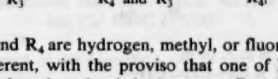


wherein Y_2 is trans—CH=CH— or $—CH_2CH_2—$; wherein M_1 is



wherein R_5 is hydrogen or methyl; wherein L_1 is

or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein Z_7 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,

(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2

(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—

(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—, or

(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,

wherein g is one, 2, or 3;

wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's

being the same or different, with the provisio that not more than two T's are other than alkyl;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation, and the 1,11- or 1,15-lactones thereof.

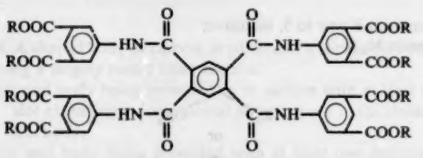
4,118,585

ANIONIC BENZENE TETRAKIS CARBONYLIMINO ISOPHTHALIC ACID SALTS

Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 1, 1977, Ser. No. 812,193
Int. Cl.² C07C *63/32, 69/76*
U.S. Cl. 560—44 **3 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of alkali metal; and the pharmaceutically acceptable salts thereof.

4,118,586

PROCESS FOR PREPARING DIHYDROXYTOLUENE

Stephen L. Goldstein, Cheshire, and John S. Babiec, Jr., Orange, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 12, 1977, Ser. No. 832,306
Int. Cl.² C07C *37/10*
U.S. Cl. 568—767 **10 Claims**

1. A process for preparing dihydroxytoluene from the distillation residue obtained from the distillation of the product of phosgenating toluene diamine to form the corresponding diisocyanate, which process comprises heating said distillation residue to a temperature of about 180°–270° C. in the presence of an aqueous solution of phosphoric acid in which the concentration of said acid ranges from about 5 to about 50% by weight, said aqueous solution being employed in such a proportion as to provide the equivalent of about 0.001 to about 0.3 gram-moles of phosphoric acid per gram of said residue.

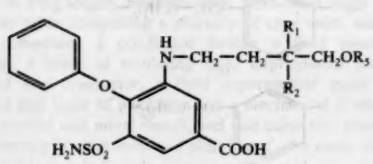
4,118,587

NOVEL 4-PHENOXY-5-SULFAMYLBENZOIC ACID DERIVATIVES

David Llewellyn Coffen, Glen Ridge, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 668,758, Mar. 22, 1976, abandoned. This application Nov. 1, 1976, Ser. No. 737,630
Int. Cl.² C07C *143/80*
U.S. Cl. 560—251 **4 Claims**

1. A compound of the formula



wherein R_1 is individually hydrogen, R_2 is individually hydroxy or taken together with R_1 is oxo, R_3 is hydrogen or lower alkanoyl, or pharmaceutically acceptable salts thereof.

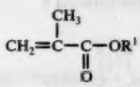
4,118,588

MANUFACTURE OF METHACRYLIC ACID AND METHYL METHACRYLATE

Gerd Fouquet, Ludwigshafen; Franz Merger, Frankenthal; Rolf Platz, Mannheim, and Karl Baer, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

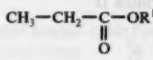
Filed Mar. 25, 1977, Ser. No. 781,149
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615887; Feb. 12, 1977, 2706076
Int. Cl.² C07C *69/52*
U.S. Cl. 560—210 **12 Claims**

1. A process for the manufacture of methacrylic compounds of the formula



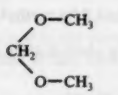
I

where R^1 is a substituent chosen from H and CH_3 which comprises reacting a carboxyl compound of the formula



II

where R^1 has the above meaning, with dimethoxymethane of the formula



III

in the presence of catalysts containing one or more salts selected from the group consisting of phosphates and silicates of magnesium, calcium, aluminum, zirconium, thorium and titanium, the reaction time being from 0.1 to 100 seconds and the reaction being carried out in the presence of from 0 to 0.5 mole of water per mole of starting material III.

4,118,589

PROCESS FOR PREPARING OXALIC ACID AND ESTERS OF SAME

Luigi Cassar, Novara, and Andrea Gardano, Trino Vercellese (Vercelli), both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 15, 1976, Ser. No. 649,235
Claims priority, application Italy, Jan. 17, 1975, 19339 A/75
Int. Cl.² C07C *51/00, 55/06, 69/36*
U.S. Cl. 560—204 **9 Claims**

1. A process for the preparation of oxalic acid and alkyl esters of oxalic acid by the oxidation, in the liquid phase, of carbon monoxide and a liquid selected from the group consisting of water and monofunctional alkyl alcohols with a gas selected from the group consisting of oxygen and oxygen-containing gases, in the presence of a catalyst system of the redox type consisting essentially of palladium salts of Pd (II) or of metallic Pd (zero valent) and of soluble salts of a metal more electropositive than palladium selected from the group consisting of Cu, Co, Fe and Ni, having at least two oxidation states, being further characterized in that the reaction is conducted at a temperature ranging from 20° to about 100° C. and a pressure ranging from 10 to about 150 atm. abs. in the presence of an effective amount of a co-catalyst consisting essentially of ammonia, the concentration of the palladium salt being between 0.0001 mole per liter and 1 mole per liter, the concentration of

the salt of the metal more electropositive than palladium being between 0.01 and 1 mole per liter and the molar ratios of the salt of the metal more electropositive than palladium to ammonia ranging from 1:1 to 1:5.

4,118,590

PHOSPHORBETAINES AND PROCESS FOR MAKING THEM

Hartfrid Vollmer, Erftstadt Liblar, and Klaus Hestermann, Erftstadt Bliesheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

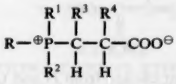
Continuation-in-part of Ser. No. 721,087, Sep. 7, 1976, abandoned. This application Oct. 27, 1976, Ser. No. 736,092

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1975, 2540260

Int. Cl.[2] C07F 9/54

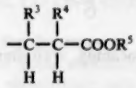
U.S. Cl. 560—190 **15 Claims**

1. Phosphobetaines of the formula I



I

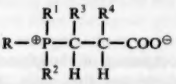
in which R^1 is methyl and R^2 has the meaning of R^1 or of R, R being a radical of the formula II



II

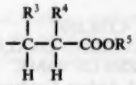
in which R^3 is hydrogen and R^4 is methyl or hydrogen, and R^5 is alkyl of 1–4 carbons.

4. A process for making phosphobetaines of the formula



I

in which R^1 is methyl and R^2 has the meaning of R^1 or of R, R being a radical of the formula II

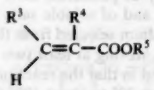


II

in which R^3 is hydrogen and R^4 is methyl or hydrogen, and R^5 is alkyl of 1–4 carbons, which process comprises reacting phosphines of the formula III

III

in which R^1 and R^4 have the meanings given above, with an α,β-unsaturated carboxylic acid of the formula IV



IV

in which R^3, R^4 and R^5 have the meanings given above, the reaction being effected in a single stage in the presence of water or a solvent/water-mixture, and separating the resulting phosphobetaines from the reaction product obtained.

4,118,591

3,7-INTER-M-PHENYLENE-4,5,6-TRINOR-PGD$_1$ COMPOUNDS

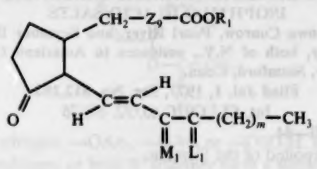
David C. Peterson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,244, Sep. 17, 1975. This application Jun. 23, 1977, Ser. No. 809,254

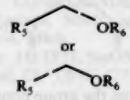
Int. Cl.[2] C07C 69/76, 177/00

U.S. Cl. 560—53 **25 Claims**

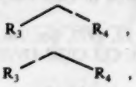
1. A prostaglandin analog of the formula



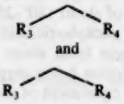
wherein m is one to 5, inclusive;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



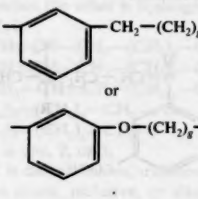
or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the provisio that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and

wherein Z_9 is



(1)

(2)

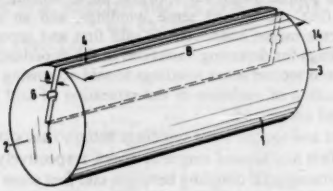
wherein g is one, 2, or 3.

4,118,592

CARBON ELECTRODE AND OTHER SHAPED CARBON BODIES

Franz Schieber, Röthenbach, Fed. Rep. of Germany, assignor to C. Conradty Nurnberg GmbH & Co. KG, Gruntal, Fed. Rep. of Germany

Filed Oct. 19, 1976, Ser. No. 734,006
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1975, 2554606
Int. Cl.[2] H05B 7/07
U.S. Cl. 13—18 R 21 Claims



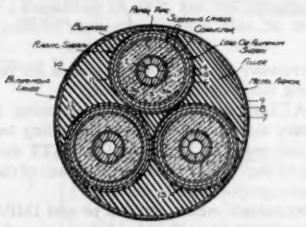
1. A shaped body of carbon, in particular a carbon electrode, having a largely round cross section:
(a) said body being provided in its surface with at least one slot extending in longitudinal direction and to the inside of the body;
(b) said body being provided with at least one depression extending inwardly from the surface of said slot; and
(c) a refractory filler material substantially filling said slot and said depression;
and wherein said filler material shields said surface of said slot against oxidation, allows for variations of the slot width when a temperature gradient develops within the electrode cross section, and wherein the filler material in said depression anchors the filler material in said slot.

4,118,593

PROCESS FOR MANUFACTURING MULTI-CORE ELECTRIC POWER CABLES AND CABLES SO-PRODUCED

Andrea Borroni, Carimate (Como), Italy, assignor to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed Nov. 24, 1976, Ser. No. 744,609
Claims priority, application Italy, Dec. 5, 1975, 30001 A/75
Int. Cl.[2] H01B 9/06
U.S. Cl. 174—26 R 16 Claims



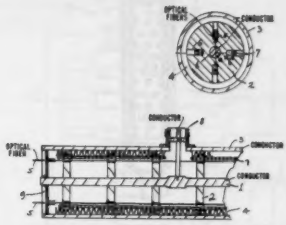
12. A long-length, multiple core, fluid-filled, high tension electric cable comprising a plurality of core units, each core unit comprising a conductor having a fluid passageway therein, a layer of insulating fluid impregnated insulation around said conductor, a fluid impermeable metal sheath around said layer of insulation and a mechanical re-enforcing layer around said metal sheath, and said cable also comprising an armoring layer around said plurality of core units, said core units being in side-by-side relation within said armoring layer and being separately filled with said insulating fluid and said metal sheath preventing fluid flow from the inside to the outside of each core unit.

4,118,594

LONG DISTANCE COAXIAL CABLE WITH OPTICAL FIBRES

Maurice Arnaud, Paris, France, assignor to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Dec. 27, 1976, Ser. No. 754,609
Claims priority, application France, Dec. 30, 1975, 75 40056
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.23 6 Claims



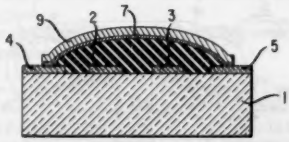
1. A disc insulated coaxial cable for wideband long distance communication comprising:
an inner conductor;
disc shaped spacers on said conductor;
an outer transversally corrugated dielectric ribbon wrapped around said discs;
an outer conductor surrounding said dielectric ribbon;
means defining notches in the periphery of said discs;
optical fibers disposed in said notches paralleling said inner conductor; and
keeper means retaining said fibers in said notches.

4,118,595

CROSSOVERS AND METHOD OF FABRICATION

Arnold Pfahnl, Allentown, Pa., and Joris Maarten Schuller, Fort Worth, Tex., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 6, 1977, Ser. No. 803,802
Int. Cl.[2] H05K 1/00
U.S. Cl. 174—68.5 12 Claims

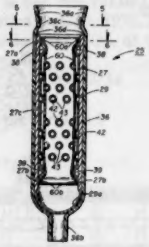


1. In a microelectronic circuit comprising a pair of conductive elements and a conductor therebetween on an insulating substrate, a structure which provides an electrical connection between said pair of conductive elements comprising an insulating layer formed over the conductor between said pair, said insulating layer comprising 50–90% by weight SiO_2 with a particle size of 3 μm or less and including 0.5–5% by weight of fumed silica and 10–40% by weight of an organic dielectric, and a crossover conductor formed on said insulating layer making electrical contact between said pair of conductive elements.

4,118,596
CONNECTOR WITH PERFORABLE INSULATIVE LINER AND METHODS OF FABRICATING SAME

Henry C. Bassett, Addison; Charles A. From, Jr., Elmhurst, both of Ill.; John F. Parker, Dubuque, Iowa, and Ansel A. Worley, Lombard, Ill., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 597,742, Jul. 21, 1975, Pat. No. 4,019,250.
This application Dec. 16, 1976, Ser. No. 751,249
Int. Cl.[2] H01R 5/10
U.S. Cl. 174—87 10 Claims



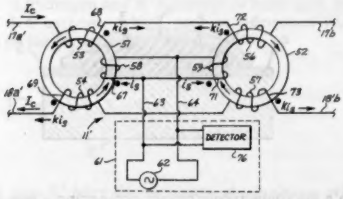
1. A deformable connector for insulated electrical conductors, which comprises at least one metallic sleeve having a plurality of inwardly projecting insulation-piercing tangs, and an outer insulative jacket, wherein the improvement comprises:

a thin, perforable film of plastic material positioned to overlie the distal ends of the tangs, and to extend in both the circumferential and longitudinal directions, with no overlapped regions, and with no discontinuities, as a continuous single-wall liner over at least the area thereof that is coextensive with the underlying area of said sleeve within which said plurality of tangs are formed, said plastic film being readily pierced by the tangs upon deformation of at least said one sleeve.

4,118,597
METHOD AND APPARATUS FOR DETECTING DIRECT CURRENTS IN A TRANSMISSION LINE

Darryl F. Proctor, Redmond; Peter T. Skelly, Issaquah, and Darrell D. Cole, Seattle, all of Wash., assignors to Proctor & Associates Company, Redmond, Wash.

Filed Jun. 23, 1975, Ser. No. 589,191
Int. Cl.[2] H04M 3/22; H02H 1/02
U.S. Cl. 179—18 FA 2 Claims



1. An apparatus for detecting dc loop current flow, while rejecting longitudinal current flow, in a pair of conductors of a telephone transmission line which transmits voice signals between a central office and a subscriber's station, comprising:

first and second, substantially identical, magnetic cores, and first and second pairs of drive windings, one winding of each of said first and second pairs of drive windings being connected in series with a separate one of said conductors of said telephone transmission line and said first and second pairs of windings being so associated with said first and second cores, respectively, so that longitudinal current flow in said conductors induces mutually opposed, self-cancelling flux components in each of said first and second cores, and so that dc current flow in said conductors induces additive flux components in each of said first and second cores that drive each of said cores toward magnetic saturation;

first and second sense windings associated with said first and second cores, respectively;

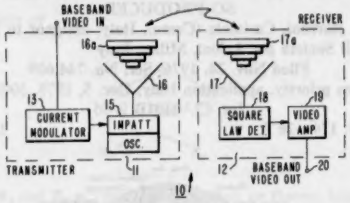
sensing circuit means connected to said first and second sense windings, said sensing circuit means including an ac signal source means for applying an ac sensing signal to said first and second sense windings, and an electrical detector means connected to said first and second sense windings for detecting variations in the impedance of said first and second sense windings to said ac sensing signal as a function of variation in the saturation of said first and second cores; and

said first and second sense windings being so associated with said first and second magnetic cores, respectively, so that electromagnetic coupling between said first sense winding and said first pair of drive windings on said first core is in phase opposition to electromagnetic coupling between said second sense winding and said second pair of drive windings on said second core, whereby ac signals that are electromagnetically coupled between said first sense winding and said first pair of drive windings are electrically cancelled by equal and opposite phase signals which are electromagnetically coupled between said second sense winding and said second pair of drive windings.

4,118,598
AMPLITUDE MODULATED IMPATT DIODE OSCILLATOR AND A LOW COST COMMUNICATION SYSTEM USING SAME

John Joseph Risko, Cranbury, and Louis Sebastian Napoli, Hamilton Square, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 25, 1975, Ser. No. 616,887
Int. Cl.[2] H03D 1/10; H04B 1/22
U.S. Cl. 325—26 9 Claims



1. A microwave communications system for broadcasting and receiving video signals, comprising:

an IMPATT diode oscillator for generating RF carrier frequency signals, said oscillator including an IMPATT diode and means for biasing said IMPATT diode into the avalanche region where the output power of the RF signal is linearly proportional to current,

current modulator means coupled to said IMPATT diode and responsive to said video signals for changing the current through said IMPATT diode to provide an RF power output proportional to the voltage level of said video signals and an envelope amplitude proportional to the square root of the video signal,

means coupled to said oscillator for radiating the varying power level signals from said oscillator,

means remotely located from said radiating means for receiving said radiated varying power level RF signals, and

means including only a square law detector coupled to said receiving means and responsive to said varying power level RF signals for providing voltage variable signals proportional to the square of the input voltage which

constitute the reconstructed video signal compensated for the compression of the signal in the modulator to thereby provide an overall linear system.

4,118,599

STEREOPHONIC SOUND REPRODUCTION SYSTEM

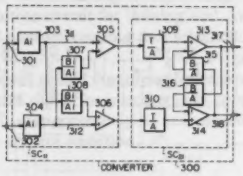
Makoto Iwahara, and Toshinori Mori, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Feb. 25, 1977, Ser. No. 772,149

Claims priority, application Japan, Feb. 27, 1976, 51-20098; Mar. 14, 1976, 51-27313; Mar. 14, 1976, 51-27314

Int. Cl.[2] H04R *5/00*

U.S. Cl. 179—1 G **13 Claims**



1. Apparatus for deriving signals to be applied to a multichannel sterophony using loudspeakers in spaced relation with respect to a listener, comprising;

binaural localization circuit means receptive of signals from a first signal source for developing a binaural representation of said first signal, said binaural representation consisting of first and second binaurally correlated signals which localize a binaural sonic image at a desired location; and

crosstalk cancellation circuit means receptive of said first and second binaurally correlated signals for developing third and fourth binaurally correlated signals for application to said loudspeakers without producing the effect of acoustic crosstalk which might be preceptible by said listener if said first and second binaurally correlated signals were supplied directly to said loudspeakers.

4,118,600

LOUDSPEAKER LOWER BASS RESPONSE USING NEGATIVE RESISTANCE AND IMPEDANCE LOADING

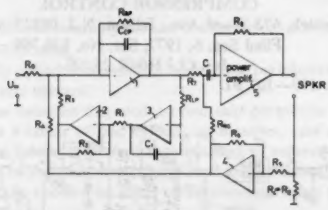
Karl Erik Ståhl, Haggviksvagen 14, Sollentuna, Sweden

Filed Mar. 23, 1977, Ser. No. 780,454

Claims priority, application Sweden, Mar. 24, 1976, 7603585

Int. Cl.[2] H04R *3/00, 3/08*

U.S. Cl. 179—1 D **32 Claims**



1. An apparatus for improving the bass response of an electrodynamic loudspeaker comprising:

means including an electrical network for applying electrical energy corresponding to the sound to be reproduced to a voice-coil in said loudspeaker, said means having an effective output impedance substantially equivalent to a negative resistance in series with a plurality of impedances disposed in a parallel circuit;

said negative resistance being substantially equal in magnitude to the resistance of said voice-coil; and

said impedances in said parallel circuit having such values that the reactance of said parallel circuit has a significant influence on the bass response of said loudspeaker.

4,118,601

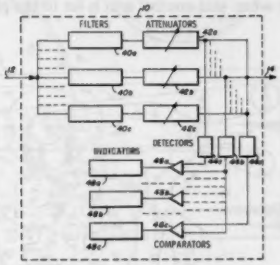
SYSTEM AND A METHOD FOR EQUALIZING AN AUDIO SOUND TRANSDUCER SYSTEM

Arthur K. C. Yeap, San Francisco, Calif., assignor to Audio Developments International, Palo Alto, Calif.

Filed Nov. 24, 1976, Ser. No. 744,635

Int. Cl.[2] H03J *5/24*

U.S. Cl. 179—1 D **4 Claims**



1. A system for equalizing a sound transducer system, including a source of program signals and a speaker, with an environment which is to receive the sound generated by the sound transducer system, comprising:

a plurality of contiguous, narrow, band filters substantially covering the band of spectral frequencies of the sound generated by the sound transducer system for filtering an applied signal into a plurality of filtered signals;

means connected to the output of each filter for controlling the amplitude of each filtered signal and for providing a plurality of amplitude controlled signals;

means responsive at all times to each individual amplitude controlled signal for detecting each amplitude controlled signal and for simultaneously providing a plurality of detected signals;

means responsive at all times to each of said detected signals and a reference signal and operative to provide a plurality of comparison signals continuously, each being commensurate with the difference between one of said detected signals and said reference signal, whereby said comparison signals are produced when said system is passing program signals; and

means for combining all of said amplitude controlled signals and for forming an equalized signal.

4,118,602

TELEPHONE ANSWERING DEVICE HAVING SIMPLIFIED MECHANICAL CONTROLS

Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406

Filed Feb. 9, 1977, Ser. No. 766,898

Int. Cl.[2] H04M *1/64*

U.S. Cl. 179—6 R **7 Claims**

1. In a telephone answering device of the type having a magnetic tape loop on which an outgoing announcement is recorded for transmission during an outgoing message portion of the answering cycle, a magnetic tape on which messages incoming from the telephone line are recording during an incoming message portion of the answering cycle, a motor and drive mechanism for said magnetic tape, and a ring detector connected to said telephone line and operative to connect a source of power to said motor and other device circuitry in

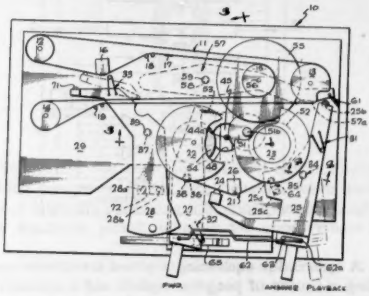
response to detection of a ring signal, the improvement comprising:

a chassis,

a forward-rewind control arm mounted to said chassis so as to pivot between a forward position wherein said drive mechanism is conditioned to drive said magnetic tape onto a takeup reel, and a rewind position in which said drive mechanism is conditioned to rewind said magnetic tape onto a source reel,

an answer-playback control arm mounted to said chassis so as to pivot between an answer position and a playback position,

(a) an erase magnet mounted on said answer-playback control arm so as to be brought into operative contact with said magnetic tape when said control arm is pivoted to the answer position, and to be removed from such operative contact when said control arm is set to the playback position,



(b) said tape loop being rim-driven from said takeup reel, said answer-playback control arm having a lever portion that disengages the tape loop rim drive so as to immobilize said tape loop when said answer-playback control arm is in the playback position, and

(c) a switch actuated by pivoting said answer-playback control arm into said playback position, said switch, when actuated, connecting said source of voltage to said motor, and

a lost motion linkage between said control arms for moving said answer-playback control arm into the playback position when said forward-rewind control arm is pivoted to the rewind position, and for moving said forward-rewind control arm to the forward position when said answer-playback control arm is moved back to the answer position.

4,118,603

DC SIGNALING CIRCUIT FOR USE IN CONJUNCTION WITH ISOLATION TRANSFORMERS

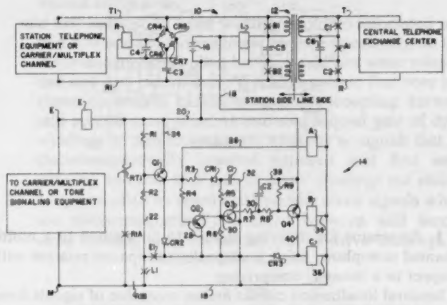
Elmer B. Kumhyr, Raleigh, N.C., assignor to Noramco, Inc., Raleigh, N.C.

Filed May 31, 1977, Ser. No. 801,733

Int. Cl.[2] H04M *3/18, 1/18*

U.S. Cl. 179—16 E **12 Claims**

1. In a telecommunication system including a wire pair connected to a central telephone switching exchange and leading to a station telephone located at a power substation or generating plant, and wherein a high voltage protection barrier is provided by an isolation transformer interposed between the station telephone and the telephone switching exchange for providing protection against fault conditions that could apply hazardous voltages endangering life and property to said wire pair leading from the site of the station telephone, the improvement comprising a DC signaling circuit electrically connected to the station side wire pair and responsive to the actuation of a DC detection circuit electrically connected to the station side wire pair for effectively transferring DC signals, supervisory functions, or DC pulse logic across said isolation transformer and the high voltage protection barrier created thereby to the wire pair leading from the isolation transformer to the telephone switching exchange, said DC signaling circuit comprising: first relay means and first relay contact means operatively associated with said wire pair on a line side of said isolation transformer that leads to said telephone switching exchange, said first relay means being responsive to a given DC signal in said DC signaling circuit for actuating said first relay contact means which causes a DC signal corresponding to said given DC signal to be communicated by said wire pair on said line side of said isolation transformer to said telephone switching exchange; second relay means and said second relay contact means operatively connected in said DC signaling circuit with said second relay contact means being operatively connected


STATION TELEPHONE EQUIPMENT OR CARRIER/MULTIPLEX CHANNEL
CENTRAL TELEPHONE EXCHANGE CENTER
STATION SIDE
LINE SIDE
TO CARRIER/MULTIPLEX CHANNEL OR TONE SIGNALING EQUIPMENT

on each side of said isolation transformer and effective upon actuation to completely shunt all windings of said isolation transformer, and wherein said second relay means is responsive to certain DC pulse signals generated by said station telephone for actuating said second relay contact means and consequently causing all windings of said isolation transformer to be shunted so as to effectively remove the inductance from the station and line side wire pairs and thereby generally prevent distortion of the logic content of any DC signal or signals being communicated by said wire pair; and means operatively associated with said second relay means for maintaining said second relay means in an operative actuating state for a time interval after each pulse generated by said station telephone; and a power source operatively connected to said DC signaling circuit for supplying the same with current to actuate said first and second relay means, and other components thereof.

4,118,604

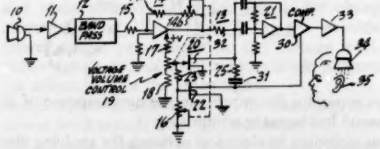
LOUDNESS CONTOUR COMPENSATED HEARING AID HAVING GANGED VOLUME, BANDPASS FILTER, AND COMPRESSOR CONTROL

Paul Yanick, 673 Wood Ave., Edison, N.J. 08817

Filed Sep. 6, 1977, Ser. No. 830,769

Int. Cl.[2] H04R *25/00*

U.S. Cl. 179—107 FD **10 Claims**



1. In a hearing aid apparatus for the handicapped, said apparatus employing an amplifier having a gain controlled by a handicapped user in varying a gain control associated with said apparatus, in combination therewith, comprising:

(a) a frequency selective circuit having a controllable frequency bandpass characteristic is adapted to receive audio signals at an input for propogating a given frequency range of said signals according to said bandpass and an input control terminal for varying said bandpass according to the magnitude of a signal applied thereto,

(b) control means responsive to the variation of said gain control for providing a control signal according to said variation, said control means coupled to said input terminal of said selective circuit for varying said bandpass according to said gain as controlled by said user, wherein said control signal is operative to control the slope of said frequency selective circuit according to said gain as selected by said user,

(c) compressor means having an input coupled to said frequency selective circuit for limiting said controlled slope signal at an ouput according to a selectable compression ratio, and

(d) means coupled to said compressor means and responsive to said control signal for selecting said compression ratio according to said control signal and therefore according to said gain control variation.

4,118,605

COIL MOUNT STRUCTURE

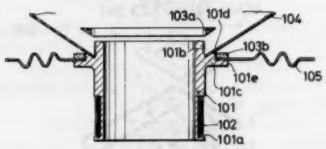
Fumio Kobayashi, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1978, Ser. No. 867,917

Claims priority, application Japan, Jan. 19, 1977, 52-4761

Int. Cl.[2] H04R *9/04*

U.S. Cl. 179—115.5 VC **15 Claims**



1. A coil bobbin assembly for use in a loudspeaker of moving coil type comprising,

a generally cylindrical member having one peripheral thread at one end thereof;

an annular member disposed around said peripheral thread to form a collar of said cylindrical member, said annular member having a first surface adapted to receive a neck portion of a cone-shaped diaphragm and a second surface adapted to receive an inner circumferential edge portion of a damper;

a first member to be engaged with said peripheral thread to fix said neck portion of said diaphragm between said first surface and said member;

a second member for fixing said inner circumferential edge portion of said damper to said second surface of said annular member; and

a coil mounting means associated with said cylindrical member.

4,118,606

ACOUSTICAL VOICE TRANSMITTING HEADSET

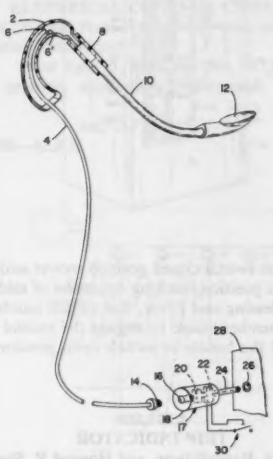
Wallace Keith Larkin, 360 Hidden Valley Rd., Soquel, Calif. 95073

Continuation-in-part of Ser. No. 561,473, Mar. 24, 1975, Pat. No. 3,933,879, and Ser. No. 667,981, Mar. 18, 1976. This application Nov. 19, 1976, Ser. No. 743,307

The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

Int. Cl.[2] H04M *1/05;* **G10K** *11/12*

U.S. Cl. 179—156 A **12 Claims**



1. A non-electrical, acoustical, voice transmit-only headset comprising

means for mounting the headset on the head of the user;

a flexible transmitter tube supported by the mounting means and having one end adapted for adjustably positioning near the mouth of the user for conducting sound therefrom, and the other end terminating in a coupling adapted to releasably connect to electronic communications equipment remote from the user's head, whereby voice transmissions may be conducted from the user to the communications equipment.

4,118,607

INTERLOCK MEANS FOR SWITCH ENCLOSURE

Howard R. Shaffer, Westminster, Md., assignor to I-T-E Imperial Corporation, Spring House, Pa.

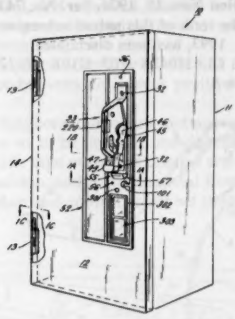
Filed Dec. 2, 1976, Ser. No. 746,834

Int. Cl.[2] H01H *9/22*

U.S. Cl. 200—50 A **9 Claims**

1. Enclosed electric switch apparatus including an enclosure having a front opening, a cover hingedly connected along a first of its edges to said enclosure for closing said opening, switch means inside said enclosure including a contact operating mechanism, switch operating means mounted to said enclosure forward of said contact operating mechanism, said operating means including platform means comprising a hollow narrow housing, a U-shaped manual operating handle having first and second arms positioned adjacent opposite sides of said housing and having an end portion thereof keyed to pivot means extending transversely of said housing, linkage means keyed to said pivot means and connected to said operating mechanism for operation of the latter by operation of said handle, said cover including means defining aperture means through which said housing extends when said cover is closed, said aperture means disposed adjacent a second edge of said cover opposite said first edge thereof, cover catch means on said platform means for holding said cover closed, defeatable cover interlock means on said platform means to prevent oper-

ation of said catch means to release said cover when said handle is in switch closed position, and defeatable switch interlock means on said platform means to prevent operation of said handle to switch closed position when said cover is open, said cover interlock including a first member interposed between said catch and the first arm of said handle whereby operation



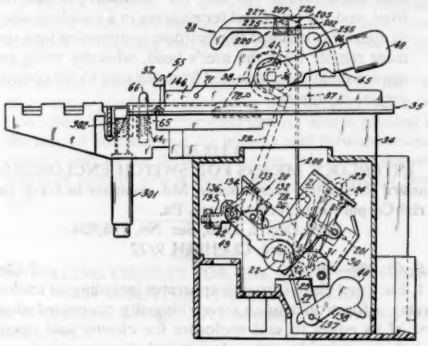
of said handle to switch closed position moves said first member to an active position blocking operation of said catch to a position for releasing said cover, said switch interlock including a second member biased to engage the second arm of the handle to hold the handle in switch open position when the cover is open.

4,118,608

TRIP INDICATOR

Frank W. Kussy, Randallstown, and Howard R. Shaffer, Westminster, both of Md., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Dec. 2, 1976, Ser. No. 746,835
Int. Cl.² H01H 9/22, 9/16
U.S. Cl. 200—56 R **7 Claims**



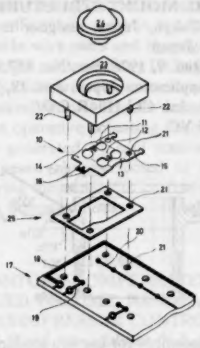
1. Enclosed electric switch apparatus including an enclosure having a front opening, a cover hingedly connected along a first of its edges to said enclosure for closing said opening, switch means inside said enclosure including a contact operating mechanism, switch operating means mounted to said enclosure forward of said contact operating mechanism, said operating means including platform means comprising a hollow narrow housing, a manual operating handle having an end portion thereof keyed to pivot means extending transversely of said housing, first linkage means keyed to said pivot means and connected to said operating mechanism for operation of the latter by operation of said handle, said cover including means defining aperture means through which said housing extends when said cover is closed, said aperture means disposed adjacent a second edge of said cover opposite said one edge thereof, cover catch means on said platform means for holding the cover closed, defeatable cover interlock means on said platform means to prevent operation of said catch means to release said cover when said handle is in switch closed position, and defeatable switch interlock means on said platform means to prevent operation of said handle to switch closed position when said cover is open, said housing having a front cavity, a trip indicator movably mounted within said cavity between a concealed and an indicating position relative to a transparent cover for said cavity, said contact operating mechanism including a cradle latchable in a latch position and automatically movable to a tripped position when unlatched as a result of predetermined fault current conditions in said switch means, and a second linkage connecting said indicator to said cradle whereby movement of said cradle to said tripped position is observable at said transparent cover in that said indicator has moved to said indicating position wherein a trip indicating portion is viewable through said transparent cover.

4,118,609

ELECTRICAL SNAP-ACTION SWITCH

Rudolf Schadow, and Klaus Hinze, both of Berlin, Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,395
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1975, 2537905
Int. Cl.² H01H 5/18
U.S. Cl. 200—67 DA **10 Claims**



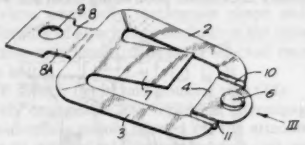
1. An electrical snap-action switch comprising a sheetmetal member divided into a plurality of strips connected at the end portions thereof by a web, which member is warped by reducing the length of at least one strip thereof, with at least one such reduced strip being connected at both ends with a non-reduced strip, serving as a bridge contact for establishing or interrupting an electrical connection between fixed contacts lying in a plane parallel to the sheetmetal member, wherein the contacts of the sheetmetal member are provided on at least one strip of the sheetmetal member which is extended in the direction of the strips beyond the web connecting the strips, so that extensions with contact-making points are formed, and means supporting said sheetmetal member for swiveling the extensions which carry the contact-making points of said member about an axis which is within the area of the connecting web extended by the extensions.

4,118,610

SNAP ACTION SWITCH BLADES

Robert F. Purssell, Plymouth; Avtar S. Bhabra, Saltash, both of England, and Guglielmo Rossi, Stutensee-Friedrichstal, Fed. Rep. of Germany, assignors to Ranco Incorporated, Columbus, Ohio

Continuation-in-part of Ser. No. 632,006, Nov. 14, 1975, abandoned. This application Mar. 18, 1976, Ser. No. 668,289
Claims priority, application United Kingdom, Nov. 16, 1974, 49726/74; Mar. 27, 1975, 12857/75
Int. Cl.[2] H01H *13/38*
U.S. Cl. 200—67 DA 11 Claims



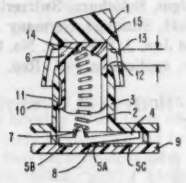
1. A snap action switch element comprising a dished blade of resilient sheet material having a base portion, two arms projecting from said base portion, a resiliently flexible internal tongue integral with the base portion and disposed between the arms, a resiliently flexible external tongue integral with the base portion and extending from the latter in the opposite directon to the internal tongue, and a bridge portion drawing together the ends of the two arms remote from the base portion of the blade, the bridge portion prestressing the blade and predisposing it for snap movement between two different configurations upon displacement relative to the arms of the end of one of said tongues, the other of said tongues having an end section constructed for anchoring to a support, at least one of said internal and external tongues resiliently deflecting upon displacement of said end of said one tongue and predetermining the force to be applied to said one tongue to effect said snap movement.

4,118,611

BUCKLING SPRING TORSIONAL SNAP ACTUATOR

Richard Hunter Harris, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1977, Ser. No. 829,039
Int. Cl.[2] H01H *13/28*
U.S. Cl. 200—67 A 4 Claims



1. In an electrical key actuating mechanism having a key top, a housing having means for slidably receiving said key top for vertical motion thereof, a pivoting rocker type electrical actuating means in said housing opposite said key top, electrical means for actuation by said electrical actuating means, and also having a buckling compression spring means under precompression and mounted between said key top and said pivoting rocker type electrical actuating means, the improvements comprising:

lateral deflection offset spring mounting means within said housing bearing against said buckling compression spring and displacing the central portion thereof relative to its ends in a first chosen direction for promoting buckling of said buckling compression spring in said first chosen direction;

mounting means on said key top for pivotally mounting the proximal end of said buckling compression spring; and

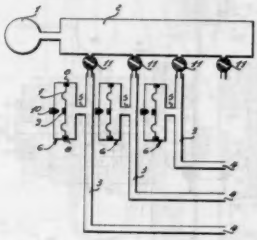
mounting means on said rocker for mounting the distal end of said buckling compression spring with an edge of said spring colinear with said pivot of said rocker.

4,118,612

ACTUATING DEVICE FOR AN INVALID OF PLURAL ELECTRICAL CONTROL CIRCUITS

Jean-Claude Gabus, Hauterive, Switzerland, assignor to Carba S.A., Berne, Switzerland

Filed Apr. 15, 1977, Ser. No. 787,921
Claims priority, application Switzerland, May 7, 1976, 5729/76
Int. Cl.[2] H01H *35/34*
U.S. Cl. 200—81.9 R 4 Claims



1. An actuating device for an invalid of plural electrical control circuits, comprising a source of air under pressure, a buffer reservoir that receives and stores said air from said source, a plurality of conduits separately and directly communicating with said reservoir, each said conduit having an open end, said open ends of said conduits being spaced apart and said conduits providing normally open passageways for the continuous flow of air from said reservoir through said conduits and out said open ends along a plurality of separate paths, a separate membrane for each said conduit, said membrane being exposed on one side to the air in its associated said conduit between its open end and said reservoir, and separate electrical contact means associated with each said membrane for opening or closing an electrical control circuit upon movement of said membrane when the pressure of the air on said one said of said membrane increases as a result of an invalid closing said open end of the associated said conduit, whereby an invalid can select a said circuit to open or close by selecting a said open end to close.

4,118,613

HYDRAULICALLY-ACTUATED OPERATING SYSTEM FOR AN ELECTRIC CIRCUIT BREAKER

Philip Barkan, Media, and Imdad Imam, Secane, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Jun. 27, 1977, Ser. No. 810,663
Int. Cl.[2] H01H *35/38*
U.S. Cl. 200—82 B 18 Claims

1. In a hydraulically-actuated operating system for an electric circuit breaker,

(a) a fluid motor comprising a cylinder and a movable piston adapted to move in an opening direction within said cylinder to open said circuit breaker and in a reverse direction within said cylinder during closing of said circuit breaker,

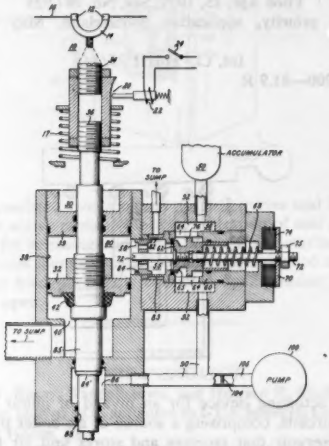
(b) an accummulator for supplying pressurized liquid to a piston-actuating space within said cylinder,

(c) a normally-closed valve located hydraulically between said accumulator and said actuating space and openable to establish communication between said accumulator and

said actuating space so that pressurized liquid from said accumulator can flow through said valve to said actuating space to drive said piston in an opening direction, said valve comprising a movable valve member that is movable from a valve-closed to a valve-open position to open said valve and is returnable to said valve-closed position to close said valve,

(d) a vent located hydraulically downstream of said valve with respect to said accumulator for affording communication between said actuating space and a low pressure region,

(e) flow control means for restricting leakage through said vent to a rate that prevents said leakage from substantially detracting from the development of pressure within said



actuating space during the period from initial opening of said valve to the time when said piston has moved through a substantial portion of its opening stroke, said flow control means acting following such period and while said valve is still open to allow effective leakage through said vent,

(f) said accumulator having a limited capacity that results in the pressure within said actuating space decaying promptly to a low value as a result of effective leakage through said vent shortly after said piston has moved through a circuit-breaker opening stroke and while said movable valve member is in its valve-open position, and

(g) means for restoring said movable valve member to its closed position in response to said pressure decay in said actuating space.

4,118,614

MULTIPLE-FUNCTION, HAND-ACTUATED SWITCH UNIT, PARTICULARLY FOR ELECTRICAL HAND TOOLS OR APPLIANCES AND THE LIKE

Gottfried Leibundgut, Solothurn, Switzerland, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jun. 2, 1977, Ser. No. 802,712

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, 2629722

Int. Cl.[2] **H01H** *13/08*

U.S. Cl. 200—157 **8 Claims**

1. Selectively multiple-function, hand-actuating switch unit structure system, particularly for electrical hand tools, appliances or the like, to provide the function

(a) ON-OFF and, selectively, at least two of the functions of

(b) speed control; (c) overload protection; (d) forward-reverse rotation; (e) radio frequency (RF) interference suppression;

said switch unit system comprising

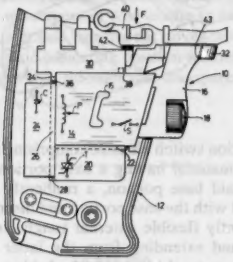
a plurality of functional circuit structure units, each located in a separate respective enclosure, and providing at least two of said functions (b) to (e),

and each formed with at least one attachment surface;

a switch housing (**14**) forming a switch enclosure and having a plurality of attachment surfaces for selective attachment thereto of selected ones of said circuit structure units;

an ON-OFF switch (S) in said switch housing (**14**) and a switch operating handle (**16**) therefor, which is manually accessible, protruding from the housing;

a first one of said circuit structure units forming an operating control circuit (**20**) electrically connectable to said switch unit, and a first control element (**18**) therefor, which is manually accessible, protruding from the switch housing



(**14**), an additional (**30**) of said circuit structure units forming an additional operating control circuit, electrically connectable to said switch unit (**14**), said additional operating control circuit including a further manually accessible control element (**32**);

and mutually interengaging separable projection-and-recess means formed on said attachment surfaces of said switch enclosure and on the enclosures of said first and second functional circuit structure units to removably and selectively attach together the switch housing forming the switch enclosure and, selectively, said two selected ones of said operating control circuits (**20, 30**) in their respectively separate enclosures.

4,118,615

HAND-ACTUATED, MULTIPLE-FUNCTION SWITCH UNIT, PARTICULARLY FOR ELECTRICAL HAND TOLLS, APPLIANCES AND THE LIKE

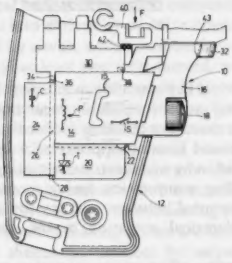
Gottfried Leibundgut, Solothurn, Switzerland, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jun. 2, 1977, Ser. No. 802,651

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, 2629723

Int. Cl.[2] **H01H** *13/08, 21/04, 15/04, 9/02*

U.S. Cl. 200—157 **23 Claims**



1. Multiple function, selectively combinable hand-actuated

switching unit structure system, particularly for electrical hand tools, appliances and the like, to provide the functions of

(a) ON-OFF, and, selectively, at least two of the functions of

(b) speed control;

(c) overload protection;

(d) forward and reverse rotation;

(e) radio interference (RF) interference supression,

said switching unit comprising

a plurality of functional circuit structure units (**20, 24, 30**), respectively providing said function (b) to (e);

a separate enclosure for each respective circuit structure unit, each enclosure being formed with at least one attachment surface;

a switch housing unit (**14**) having an integrated enclosure of, in plan view, essentially rectangular shape and formed with a plurality of attachment surfaces at the sides thereof for selective attachment thereto of selected ones of said structure units;

an ON-OFF switch (S) in said housing unit (**14**);

and relatively engageable and separable interengaging projection-and-recess means formed on the attachment surfaces at said sides of said switch housing unit and on the attachment surfaces of said functional circuit structure units to assemble and secure a selected one of said functional circuit structure units to the switch housing unit by matching engagment of said respective attachment surfaces and interengagement of said separable projection-and-recess means.

4,118,616

CASSETTE, PARTICULARLY A CASSETTE FOR A REEL OF WIDE RECORDING TAPE

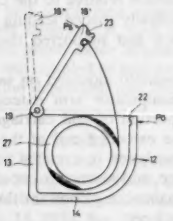
Heinrich Wittkamp, Mannheim, and Manfred Gehrung, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 12, 1977, Ser. No. 796,155

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621723

Int. Cl.[2] **B65D** *85/612*

U.S. Cl. 206—387 **7 Claims**



1. A cassette, in particular a cassette for a wide recording tape, consisting of a housing in the form of an approximately rectangular hollow body having two flat broad sides forming two long walls and two parallel short sides facing each other forming two narrow walls, and a closable lid pivotally mounted between the said narrow walls, at least a portion of at least one of the long walls being elastically deformable for opening the cassette, and the edge of the lid having at least one beveled surface which associates with a beveled surface on the edge of said wall portion of the housing, and disengageable snap latch means in the form of cams and grooves on the walls and lid being provided to keep the cassette closed, wherein the housing and the lid are made of different plastic materials and wherein the snap latch means interact between the long side of the lid and the long wall of the housing opposite the pivotal axis of the lid, each of the cams and grooves being arranged at a distance from the narrow sides of the housing, and the cams and grooves at the edge of the said long wall and the cams and grooves at the edge of the long side of the lid, when engaged having an S-shaped or sawtooth-shaped cross section, so that, when the cassette is opened by deformation of the elastically deformable portion of said long wall, a closing force is initially produced to counteract the opening force, which closing force presses the cams into the grooves to make opening of the cassette more difficult.

4,118,617

PROCESS AND APPARATUS FOR CONTINUOUS HEAT TREATMENT OF METALLIC WIRES AND BANDS

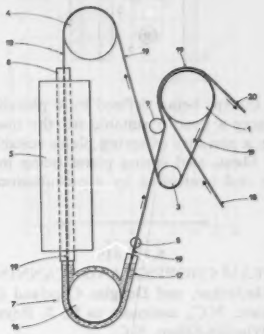
Marc Moreau, Asnieres, France, assignor to Trefimetaux, Paris, France

Filed Oct. 15, 1975, Ser. No. 622,704

Claims priority, application France, Oct. 18, 1974, 74 40560

Int. Cl.[2] **H05B** *5/08*

U.S. Cl. 219—10.61 R **4 Claims**



3. Apparatus for the continuous heat treatment of thin metallic wire and band members by induction heating in a closed loop established between the untreated and heat treated members comprising induction means for heating the members to be treated, a first pulley member having a deep groove in the periphery thereof, said deep groove defining a circular base, a return pulley, cooling means, and means for guiding the metallic wire and band members to be treated successively over said circular base of said first pulley, through said induction means, through said cooling means, over said return pulley and again over said deep groove of said first pulley in superposed relation with the untreated product without relative sliding of the treated and untreated wire and band members.

4,118,618

DEVICE FOR WELDING OPTICAL FIBRES END TO END

Francis Gauthier, Oullins, and Georges Mignien, Meyzieu, both of France, assignors to Les Cables de Lyon, Lyon, France

Filed Apr. 12, 1977, Ser. No. 786,950

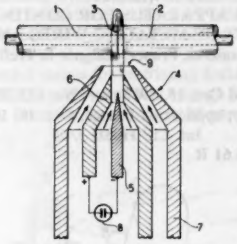
Claims priority, application France, Apr. 14, 1976, 76 10971

Int. Cl.[2] **B23K** *9/00*

U.S. Cl. 219—121 P **2 Claims**

1. An apparatus for end to end welding of a plurality of optical fibres disposed in a layer, each fibre being formed of a bared part and a covered part supported by a positioning block, the bared part of the fibre being disposed in a positioning groove and the covered part of the fibre being clamped in a support, the ends of the bared parts of the fibres being adjacent to each other for welding, wherein: said device comprises means for moving a microplasma blow torch for welding said fibres, said blow torch having its vertical axis above said ends of the layer of fibres to be welded and being perpendicular to said fibres; said positioning block being formed of a plurality of said parallel positioning grooves being in parallel relation with respect to one another and having rounded side surfaces, each groove having a bottom communicating with a small diameter bore running parallel to said groove, and a slot formed below the weld line intersecting each of said positioning grooves in its

middle, said slot communicating with a void for receiving plasma gas, and said support having two multiple clamps on either side of said weld line in the axis of the fibres which are capable of moving with said covered parts and being adapted to preposition the fibres in relation to said grooves and position the ends of said bared parts adjacent to one another each of



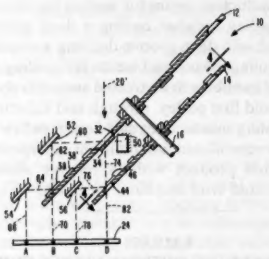
said multiple clamps being defined by a plurality of support plates containing a groove suitable for the insertion of said covered fibre; a plurality of spring plates suitable for locking said covered fibres, said spring plates being integral with a support plate and controlled by a push-button and a tared spring.

4,118,619

ROTARY BEAM CHOPPER AND SCANNING SYSTEM

Colin Shaw McArthur, and Douglas Copeland Clark, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 2, 1977, Ser. No. 821,103
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 L **20 Claims**



1. A rotary optical shutter and scanner for dividing a substantially continuous beam of light into a plurality of discrete light impulses and for repetitively scanning the impulses across a series of target areas, comprising:

a plurality of coaxial rotatable discs;

at least one annular shutter ring on each said disc, each shutter ring including at least one group of segments, said rings having corresponding, angularly aligned groups, the segments of each group being arranged in complementary coded sequences of reflective surfaces and through apertures to define multiple light paths between a light source and a target;

means for directing a substantially continuous beam of light toward at least one of said shutter rings for reflection from a reflective surface or passage through an aperture thereof and for subsequent direction toward a first target area or toward a second shutter ring for reflection from a reflective surface thereon or passage through an aperture thereof for direction toward a second target area; and

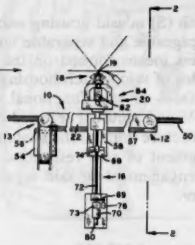
means for rotating said discs to move said segments of said annular rings into successive alignment with said beam of light whereby said beam is directed successively along said multiple light paths to each of said target areas, continued rotation causing said beam to repetitively traverse said target areas in a scanning motion.

4,118,620

COMPUTERIZED SYSTEM FOR TRANSLATING A TORCH HEAD

Alan M. Lovelace, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of William A. Wall, Jr.; Robert E. Ives; Miles Melvin Bruce, Jr.; Peter Paul Pryor, Jr., and Leslie H. Gard, all of Huntsville, Ala.

Filed May 20, 1977, Ser. No. 799,023
Int. Cl.[2] B23K *9/12*
U.S. Cl. 219—124.32 **6 Claims**



1. A computerized system for translating a torch head at a constant travel rate along an elongated track of a noncritical configuration adjacently related to a workpiece of a configuration generally conforming to the shape of the track comprising:

A. an elongated track of an arbitrary configuration extended in spaced juxtapositional relation with the surface of the workpiece;

B. a skate including a pair of trucks having mounted thereon a carriage bed, said trucks being supported for independent pivotal motion relative to the carriage bed, and are arranged in mutually spaced leading and trailing relation along said track and supported thereby for translation therealong;

C. a working assembly mounted on said skate including a torch head manipulator arm extended perpendicularly from the midportion of said carriage bed, a torch head mounted at the extended end of the arm and supported thereby for translation in a spatial relationship with said working surface, and means for imparting axial motion to said arm for maintaining constant the spatial relationship of tip to workpiece;

D. drive means mounted on said skate at one end thereof engaged with said track and having a variable drive speed for advancing said skate at a variable rate along said track; and

E. drive control means including an equation solving circuit connected to said drive means for varying the drive speed in a manner such that the torch head is advanced along said working surface at a constant travel speed, comprising:

first sensing means for continuously sensing the angular relation of each end of said carriage with instantaneous tangents to the track for providing a pair of varying computer input signals, second sensing means for sensing the spatial relationship of said torch head with a geometrically fixed skate reference line, third sensing means for continuously sensing the rate of axial motion imparted to said manipulator arm necessary for providing another varying computer input signal indicative of the rate of positional change, further sensing means for manually pre-setting a constant speed of the torch head as it translates along said work surface, and a computer

circuit connected with said first, second, third and fourth sensing means for detecting variations in said input signals and providing a speed control output signal to said drive means for varying the output thereof substantially simultaneously with variations in said computer input signals, whereby real-time control over said drive means is achieved.

4,118,621

PHOTO ELECTRIC BIASED PHOTO DIODE OPERATIONAL AMPLIFIER

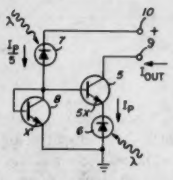
Dennis M. Monticelli, Fremont, and Robert S. Sleeth, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 19, 1977, Ser. No. 798,728

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705308

Int. Cl.[2] H01J *39/12*

U.S. Cl. 250—214 A **10 Claims**



1. A circuit for replicating the photo current of an illumination responsive element which generates a photo current when exposed to illumination, said circuit comprising:

a first photo diode adapted for exposure to said illumination to generate a current proportional to said illumination;

amplifying means coupled to said first photo diode, said amplifying means including means to force the potential across said first photo diode to substantially zero volts thereby to provide linearity between said illumination and said photo current; and

means for biasing said amplifying means substantially in proportion to said illumination, said means for biasing including a second photo diode adapted for exposure to said illumination and coupled to said amplifying means to provide illumination dependent bias thereto.

4,118,622

CONE OPTICAL SYSTEM

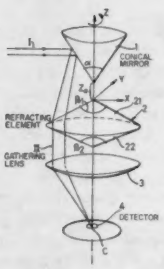
Karl-Heinz David, Den Haag, Netherlands, assignor to Organisation Européenne de Recherches Spatiales, Paris, France

Filed Nov. 18, 1976, Ser. No. 742,866

Claims priority, application Belgium, Nov. 11, 1975, 162028

Int. Cl.[2] H01J *3/14*

U.S. Cl. 250—216 **7 Claims**



7. A cone optical system as claimed in claim 1, and photoelectric detecting means (4) located at said image point and having a sensitive element that is located in a plane (X-Y) perpendicular to said symmetry axis.

4,118,623

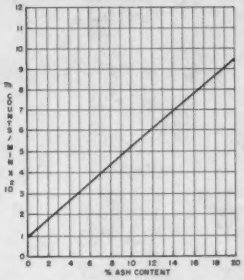
CONTINUOUS QUALITY CONTROL OF MINED HARD AND SOFT COALS

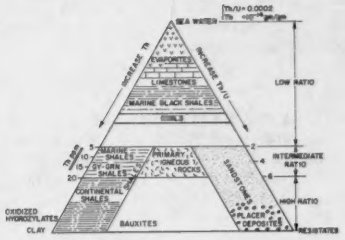
Walter H. Fertl, Houston, Tex., and Preston L. Gant, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 31, 1977, Ser. No. 783,092

Int. Cl.[2] G01V *5/00;* **E21B** *47/00*

U.S. Cl. 250—253 **7 Claims**





DISTRIBUTION OF THORIUM AND URANIUM IN SEDIMENTS

1. A method for the rapid determination of ash content of coal comprising a) determining the ratio of thorium to shale based on background gamma emissions; b) determining the ratio of shale to ash content using standard methods of ash determination; c) correlating (a) and (b) to provide a relationship of background gamma emission to ash content; and (d) thereafter determining ash content by means of surface gamma ray spectroanalysis of thorium content.

4,118,624

FRAME FOR THE SUPPORT OF ARTICLES WHICH ARE TO BE TREATED

Johannes Luckan; Jan Elwart, both of Cologne, and Martin Herter, Geyen, all of Germany, assignors to Ionit Anstalt Bernhad Berghaus, Vaduz, Liechtenstein

Filed Apr. 25, 1977, Ser. No. 790,834

Claims priority, application Fed. Rep. of Germany, May 5, 1976, 2619814

Int. Cl.[2] H01T *19/04*

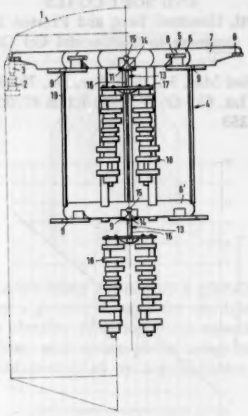
U.S. Cl. 250—326 **13 Claims**

1. Supporting means for articles to be treated in a glow discharge receptacle connected to a source of electrical power, comprising:

a support frame in said receptacle and having upwardly

open spherical seats, each having a laterally open entrance slot;

article suspension devices each having means for attaching an article thereto, neck portions in said entrance slots, spherical plugs on said neck portions and removably seated in said spherical seats, and transport plugs extending above said spherical plugs;



said suspension devices being electrically insulated from said receptacle; and

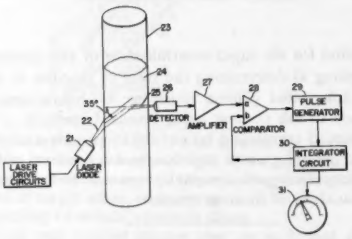
conductor means for connecting said suspension devices to said source of electrical power whereby a glow discharge is produced between said receptacle and said article on said suspension device.

4,118,625

NEPHELOMETER HAVING PULSED ENERGY SOURCE

Willie Bruce Underwood, Brandywine, Md., assignor to Dynatech Laboratories Incorporated, Alexandria, Va.

Filed May 2, 1977, Ser. No. 792,915
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—343 **7 Claims**



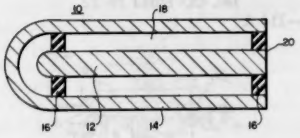
1. A nephelometer system for measuring the concentration of bacteria or other similar particulate material suspended in a liquid, said system comprising an infrared injection laser diode means for providing a pulsed beam of electromagnetic energy that is substantially monochromatic, said beam containing uniform repetitive energy pulses each having a short duration of between 20 and 200 nanoseconds, means for directing said beam through a liquid medium confined in a transparent vessel and containing a dispersion of the particles, means for detecting individual pulses of energy as foward scattered by said particles at an acute angle to said beam, and means for accurately measuring the peak amplitude of said detected pulses, said means of accurate measurement being capable of such measurement when the duration of said pulses is as short as 20 nanoseconds, and said short duration of pulses essentially enabling the system to perform its function in the presence of ambient light conditions such as daylight and artificial room lighting without the necessity of protecting the sample under test from said light.

4,118,626

GAMMA FLUX RESPONSIVE SELF-POWERED RADIATION DETECTOR

Norman P. Goldstein, Delmont, Pa., and William H. Todt, Elmira Heights, N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 23, 1977, Ser. No. 771,144
Int. Cl.[2] G01T *1/22*
U.S. Cl. 250—370 **6 Claims**



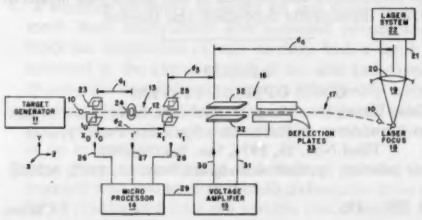
1. A gamma flux responsive self-powered radiation detector comprising a gamma flux sensitive, high density, conductive elongated central emitter, a low gamma responsive conductive tubular collector sheath spaced from and disposed about the central emitter, and low density insulating means between the emitter and the collector, wherein the insulating means density is less than about 3 grams per cubic centimeter.

4,118,627

GUIDANCE SYSTEM FOR LASER TARGETS

Gary D. Porter, Livermore, and Anatoly Bogdanoff, Danville, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 22, 1976, Ser. No. 698,553
Int. Cl.[2] G01K *1/08*
U.S. Cl. 250—397 **4 Claims**

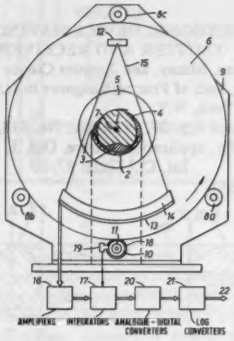


1. A guidance system for targets comprising; electrostatic sensing means for generating signals responsive to *x* and *y* coordinates and time of travel of an associated target over a predetermined distance along an initial trajectory, micro processing means for receiving said signals from said sensing means for real time calculation of position, velocity, and direction of such an associated target and for producing calculated course correction output signals, electrostatic deflecting means positioned in alignment with said sensing means and responsive to said calculated course correction output signals from said micro processing means for correcting the trajectory of such an associated target, and amplifier means operatively connected between said micro processing means and said deflecting means for amplifying said calculated course correction output signals.

4,118,628
RADIOGRAPHIC APPARATUS WITH CORRECTION FOR RADIATION HARDNESS VARIATIONS

Godfrey Newbold Hounsfield, Winthorpe, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 668,045, Mar. 18, 1976, Pat. No. 4,044,260. This application May 3, 1977, Ser. No. 793,387
Claims priority, application United Kingdom, Mar. 18, 1975, 11131/75
The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.
Int. Cl.[2] A61B *6/02*
U.S. Cl. 250—445 T **4 Claims**



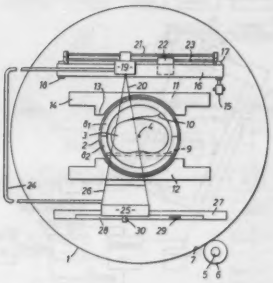
1. Medical radiographic apparatus, for examining cross-sectional slices of patients' bodies, comprising means defining a patient position, a source of a fan-shaped distribution of penetrating radiation, comprising a plurality of divergent rays of said radiation, disposed outside said patient position, scanning means for moving said source angularly around said patient position to project said radiation through a predetermined region of said patient position along a plurality of divergent beam paths from each of a series of locations distributed angularly around said patient position, detector means for detecting radiation emergent from said patient position along each of said beam paths to provide electrical output signals indicative of the amounts of radiation so emergent along said paths, processing circuit means for changing the amplitudes of the output signals corresponding to different ones of said divergent rays, from each of said locations, caused by variation of the energy spectrum of radiation propagating at different angles within the distribution and means for combining the changed output signals for a succession of said pluralities of beam paths to form an image of a body slice disposed in said region, said image comprising a pattern of image elements representing absorption coefficients of corresponding notional elements in said body slice for said radiation.

4,118,629
RADIOLOGY

Godfrey Newbold Hounsfield, Winthorpe, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 584,172, Jun. 5, 1975, Pat. No. 4,028,554. This application Mar. 11, 1977, Ser. No. 776,661
Claims priority, application United Kingdom, Jun. 7, 1974, 25361/74
The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—445 T **12 Claims**

1. Medical diagnostic radiographic apparatus, including a source of X-radiation, detector means spaced from said source and responsive to said radiation and adapted to receive the radiation after it has traversed the space from said source to said detector means, a member having an opening for receiving a patient to be examined so that said radiation traverses said patient, scanning means for moving at least said source to scan part of the body of said patient, said detector means providing output signals influenced by the variation in absorption suffered by said radiation as its traverses different paths through the scanned part of the body, processing means adapted to process said output signals to produce a representation of a

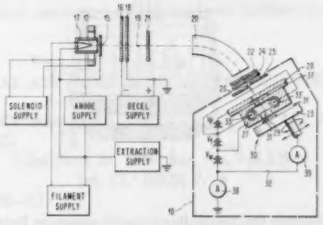


characteristic of the scanned part of the said body related to the absorption of said radiation, and means for compensating for anticipated changes in the length of the path for the radiation within the body, said compensating means including means for producing corrections in the representation which would otherwise be produced, to allow for variations in said output signals due to changes in the frequency spectrum of the X-radiation related to changes in said path length.

4,118,630
ION IMPLANTATION APPARATUS WITH A COOLED STRUCTURE CONTROLLING THE SURFACE POTENTIAL OF A TARGET SURFACE

Charles M. McKenna, Fishkill, and Wolfgang F. Mueller, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1977, Ser. No. 794,275
Int. Cl.[2] H01J *37/00*
U.S. Cl. 250—492 A **9 Claims**



1. In apparatus for bombarding a target with a beam of ions, a structure for controlling the surface charge of the target comprising

an electron source adjacent to the ion beam for providing electrons to said beam for providing netulralizing space charge to said beam,

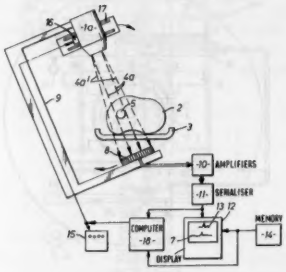
means between said target and said electron source for inhibiting direct rectilinear radiations between said source and said target, and

means for maintaining said inhibiting means at a lower temperature than said target.

4,118,631
RADIOGRAPHIC APPARATUS

Robert Justin Froggatt, Southall, England, assignor to EMI Limited, Hayes, England

Filed Mar. 25, 1977, Ser. No. 781,409
Claims priority, application United Kingdom, Mar. 30, 1976, 12679/76
Int. Cl.[2] A61B 6/00; A61N 5/00
U.S. Cl. 250—492 R 11 Claims

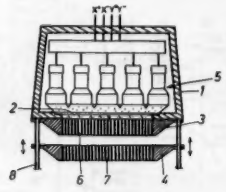


1. A therapeutic radiographic apparatus including a source of pentrating radiation, means for directing the radiation along a path through a predetermined region of the body of a patient, means disposed to receive radiation after passage through said body to provide a representation of the part of the body traversed by the radiation, means for comparing the said representation with a previously derived representation on which a feature of interest has been identified, and adjustment means for changing the path of the radiation to correlate the features of interest in the two representations.

4,118,632
NUCLEAR MEDICINE DIAGNOSTIC INSTRUMENT FOR THE DETERMINATION OF THE DISTRIBUTION PATTERN OF A RADIOACTIVE RADIATION SOURCE

Heribert Luig, Helmoltstr 7, 34 Güttingen, Fed. Rep. of Germany

Filed Oct. 26, 1976, Ser. No. 735,787
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1975, 2547981
Int. Cl.[2] G21F 5/04
U.S. Cl. 250—513 5 Claims



1. A nuclear medicine diagnostic instrument for the determination of the distribution pattern of gamma ray emission of radioactive substances serving as a gamma ray source inserted into a body and emitting gamma quanta, said instrument consisting essentially of:

the combination of a detector and an adjustable collimator means, said collimator means consisting of a plurality of multichannel collimator elements placed between the source and said detector to thereby form a distribution pattern for localizing said gamma quanta from said source in the body;

said collimator elements being formed of perforated plates and further comprising at least one moveable collimator element, said elements lying on the source side of the collimator means and being axially shiftable;

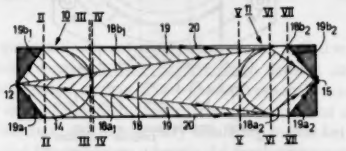
each of said plurality of collimator elements having its respective channels in mutual alignment and coaxial alignment with a neighboring channel in another collimator element to provide at least a pair of coaxially aligned collimator elements in the array; and

adjustment means including limiting means for maximum adjustment to axially shift one of the said collimator elements relative to the neighboring collimator element and to maintain alignment of the elements whereby improvement in definition and sensitivity is achieved in the pattern of radiation.

4,118,633
OPTO-ELECTRONIC DEVICE HAVING COUPLED EMITTER AND RECEIVER

Lionel Guilleman, Massy, and Jacques Claude Thillays, Herouville St Clair, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 30, 1975, Ser. No. 618,213
Claims priority, application France, Oct. 1, 1974, 74 33049
Int. Cl.[2] G02B 27/00
U.S. Cl. 250—551 8 Claims



1. An opto-electric device comprising light emitter means for converting electrical circuit into light; light receiving means for converting light from the light emitter means into electrical current; a transparent emitter optical body of revolution having a convex structure and being provided with an emitter base plane proximate said light emitter means; a transparent receiver optical body having a generally convex structure and being provided with a receiver base plane; said emitter optical body comprising a cylindrical portion on said emitter base plane, a portion having focussing properties with respect to said receiver optical body on said cylindrical portion, and a spherical cap on said portion having said focussing properties and centered on said light emitter means; said receiver optical body comprising a cylindrical portion on said receiver base plane, an exponentially varying portion on said cylindrical portion and a portion having focussing properties relative to the light receiving means on said exponentially varying portion.

4,118,634
DEVELOPER SOLUTION LEVEL DETECTOR

Joseph R. Carvalko, Bethel, and Robert J. Tolmie, Jr., Fairfield, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 3, 1977, Ser. No. 756,512
Int. Cl.[2] G01N 21/26
U.S. Cl. 250—577 19 Claims

1. In a photocopying apparatus which utilizes a liquid developer solution that is stored in a removable tank for developing photocopies; a device for indicating when the amount of developer solution in the tank falls to a predetermined level so that a predetermined amount of developer solution may be added to said tank, said device comprising:

A. a source of light;

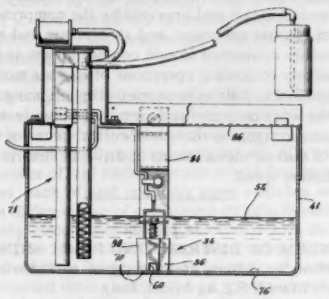
B. photosensor means, on which said light source is focused, for generating a light intensity signal only when developer solution is not between said light source and photosensor;

C. first means for mounting said light source and said photo-

sensor means at a fixed distance from the bottom of the tank when they are properly located in the photocopying apparatus, the fixed distance being substantially equal to the predetermined level; and

D. second means for automatically repositioning said first means at said fixed distance from the bottom of the tank each time that the removable tank is reinserted in the photocopying apparatus whereby the light source and photosensor are recalibrated to consistently sense substantially the same predetermined level, and

E. means responsive to said light intensity signal for indicating when developer solution is not between said light source and photosensor means to thereby indicate when the amount of solution has fallen below the predetermined level.

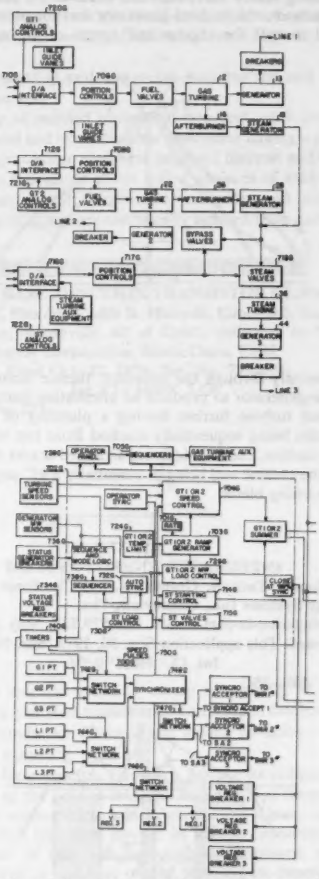


4,118,635
SYNCHRONIZATION SYSTEM FOR A COMBINED CYCLE ELECTRIC POWER PLANT

Joseph F. Barrett, and Roy W. Kiscaden, both of Springfield, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,728
Int. Cl.[2] H02J *3/00*
U.S. Cl. 290—40 R **26 Claims**

1. A combined cycle electric power plant comprising at least one gas turbine, means for generating steam in response to heat energy from said gas turbine, a steam turbine driven by steam supplied to it from said steam generating means, an electric generator driven by each of said turbines, means for controlling the operation of said turbines and steam generating means, said controlling means including a speed control for said gas turbine and a speed control for said steam turbine, means for regulating the field voltage of each of said generators, a circuit breaker means for connecting each of said generators to a power system line, means for generating signals representing each generator voltage and each line voltage, means for responding to the generator and line voltage signals to generate voltage change and turbine speed change outputs needed for synchronization and to generate a breaker close signal when line and generator matching occurs, and means for selectively coupling said responding means to the generator and line



voltage signals and the speed control and voltage regulator and breaker means associated with one of said turbines at a time.

4,118,636
THERMAL AIR POWERED ELECTRIC GENERATOR SYSTEM

Merlin B. Christian, 1000 Northwood Dr. Apt. 142, Baytown, Tex. 77521

Filed Nov. 26, 1976, Ser. No. 745,129
Int. Cl.[2] H02K *7/18*
U.S. Cl. 290—52 **7 Claims**

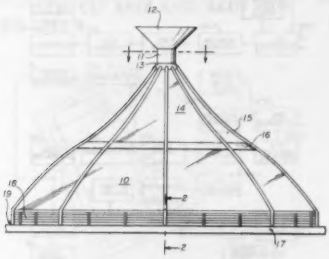
1. A thermal air powered alternating current electric generator system comprising, in combination,

(a) a generally conical structure for collecting air having an upper and lower end, said structure having a covering through which a maximum amount of radiant heat may pass from the exterior to the interior thereof,

(b) means at the lower end of said structure for the passage of air from the outside of said structure to the inside thereof,

(c) mounted on the upper end of said structure, an alternating current (Ac) producing turbine-generator whose main axis extends vertically from said structure and which comprises a shaftless turbine forming the center portion of the generator and having attached circumferentially

thereto a rotor, which when powered, rotates as an integral part of the turbine to which it is attached, and a stator surrounding the rotor and attached at the inner wall of a housing which surrounds and encloses the entire turbine-generator, the turbine-generator having means at either end thereof for ingress and egress of air which passes



upwardly through the collector, thence through the turbine-generator to produce an alternating current.

(d) said turbine further having a plurality of blades, the blades being sequentially stacked from top to bottom of the turbine, each blade being arranged across the diameter of the turbine and being at essentially a 45° angle from the preceding blade.

4,118,637

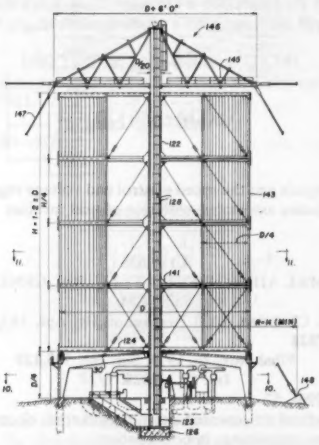
INTEGRATED ENERGY SYSTEM

Louis Eugene Tackett, Grandview, Tex., assignor to UNEP3 Energy Systems Inc., Grandview, Tex.

Continuation-in-part of Ser. No. 579,131, May 20, 1975, abandoned. This application Sep. 30, 1976, Ser. No. 728,064

Int. Cl.² H02P *9/04*

U.S. Cl. 290—55 **21 Claims**



1. A system for collecting, storing and distributing energy comprising a transmission-storage pipe system including an interconnected network of large diameter high pressure conduit for storage and transmission of large volumes of compressed air throughout a predetermined wide geographical area, a plurality of energy collector-converters including air compressor means operatively connected to said pipe system and utilizing available energy to compress air and deliver the compressed air to said pipe system, said air compressor means including a plurality of separate compressor stages, pressure responsive control means operatively interconnecting said compressor stages for automatically delivering low, intermediate or high pressure air at inversely varying flow rates to the pipe system in response to the pressure in the system, at least one air-actuated generator station, conduit means operatively connecting said at least one generator station to said pipe system for withdrawing compressed air therefrom for operating said at least one generator station, said at least one generator station including air motor means operably connected to said conduit means and operated by the compressed connected to said conduit means and operated by the compressed air for driving an electric generator, and air pressure and air volume control means connected in said conduit means and operable simultaneously to control operations of said air motor means, said air pressure and air volume control means being capable of varying the work output of said air motor means in accordance with a demand signal to thereby accurately control the rate of rotation of said air motor means to drive an electric generator at its optimum speed.

4,118,638

SYSTEM OF DISTRIBUTING PILOT SIGNALS

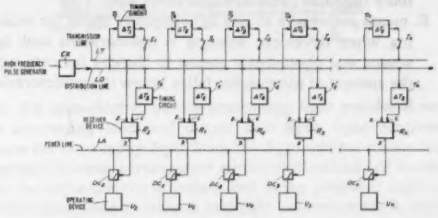
Franco Huwyler, Milan, Italy, assignor to Fabbrica Italiana Magneti Marelli S.p.A., Milan, Italy

Filed Dec. 14, 1976, Ser. No. 750,502

Claims priority, application Italy, Dec. 19, 1975, 30490 A/75

Int. Cl.² H02J *4/00*

U.S. Cl. 307—11 **15 Claims**



1. A system for generating a plurality of pilot signals comprising:

means for generating a succession of time period initiation pulses, each of said time period initiation pulses defining a different system time period;

a first set of timing circuits comprising a plurality of timing circuits, each timing circuit in said first set of timing circuits having a characteristic time interval associated therewith, the characteristic time interval associated with each timing circuit in said first of timing circuits being different than the characteristic time interval of at least one other timing circuit in said first set of timing circuits, each said timing circuit in said first set of timing circuits adapted to generate a gating pulse at its output responsive to the generation of each of said time period initiation pulses and after a time delay equal to the characteristic time interval associated therewith;

a second set of timing circuits comprising a plurality of timing circuits, each timing circuit in said second set of timing circuits having a characteristic time interval associated therewith, the characteristic time interval associated with each timing circuit in said second set of timing circuits being identical to the characteristic time interval of at least one timing circuit in said first set of timing circuits whereby operative couplings between said timing circuits of said first and second sets of timing circuits are provided, each said timing circuit in said second set of timing circuits adapted to generate a gating pulse at its output responsive to the generation of each of said time period initiation pulses and after a time delay equal to the characteristic time interval associated therewith;

a pulse distribution line connected to an output of said time

period initiating pulse generating means and receiving said time period initiation pulses;

means for coupling each of said timing circuits in said first and second set of timing circuits to said pulse distribution line;

a plurality of receiver devices each having first and second inputs and an output, each of said receiver devices adapted to generate a pilot signal at its output when gating signals are simultaneously applied to both its inputs, each said receiver device associated with a different timing circuit in said second set of timing circuits and thereby associated with the characteristic time interval of its associated timing circuit;

a transmission line;

means for coupling the output of each of said timing circuits in said second set of timing circuits to said first input of the receiver device with which it is associated;

a plurality of normally opened switches equal in number to the number of said timing circuits in said first set of timing circuits, each of said normally open switches associated with a different one of said timing circuits in said first set of timing circuits and thereby associated with the characteristic time interval of its associated timing circuit, each of said switches for applying a gating signal generated by its associated timing circuit to said transmission line when its associated switch is selectively closed by an operator of said system; and

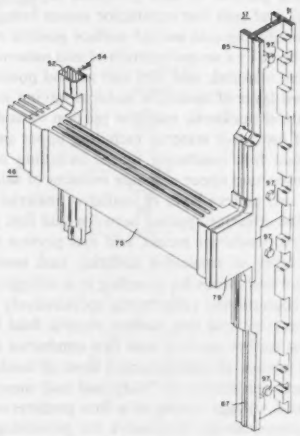
means for coupling said transmission line to said second input of each of said receiver devices whereby a pilot signal is generated at the output of any receiver device whose associated characteristic time interval is identical to the characteristic time interval associated with a normally open switch which has been selectively closed by an operator of said system.

4,118,639

ELECTRICAL SWITCHBOARD APPARATUS INCLUDING BUS SYSTEM WITH INDIVIDUAL PHASE ISOLATION

Richard Rosey, Plum Borough; George N. Kovatch, Monroeville, both of Pa., and Ned H. Simon, Queeny Township, St. Louis County, Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1976, Ser. No. 755,540
Int. Cl.[2] H01B *7/28*
U.S. Cl. 307—147 **21 Claims**



1. Electrical power distribution switchboard apparatus, comprising:

a cabinet;

a multiphase horizontal main bus mounted within said cabinet and being connected to a source of electrical power, said main bus comprising a plurality of spaced parallel individual horizontal phase conductors;

a multiphase vertical riser bus mounted within said cabinet and connected to an electrical load, said vertical riser bus comprising a plurality of individual vertical phase conductors;

means connecting said horizontal main bus and said vertical riser bus; and

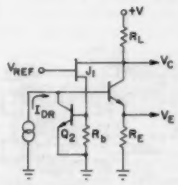
a plurality of molded protective members, each individual horizontal and vertical phase conductor having a plurality of said protective members mounted thereon and cooperating to separately cover major surfaces of each of said individual phase conductors, whereby said individual phase conductors are electrically isolated from each other.

4,118,640

JFET BASE JUNCTION TRANSISTOR CLAMP

Sam S. Ochi, San Jose; Adib R. Hamade, Cupertino, and Daniel D. Culmer, Sunnyvale, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 22, 1976, Ser. No. 735,879
Int. Cl.[2] H03K *5/08*
U.S. Cl. 307—237 **1 Claim**



1. A base junction transistor clamp comprising:

a first base-junction transistor to be clamped fabricated into a semiconductor substrate and having its emitter coupled to said substrate;

a second-base juncton transistor having its collector connected to the base of said first base-junction transistor, its emitter connected to said substrate, and a base; and

a field-effect transistor having its source connected to the collector of said first base-junction transistor, its drain connected to said base of said second base-junction transistor and its gate connected to a source of reference potential, thereby causing the potential at the collector of said first base-junction transistor to be clamped at a level established by said reference potential.

4,118,641

CHOPPER INCLUDING TRANSISTOR SWITCHES

Roger Lannuzel, Saint-Denis, France, assignor to Compagnie Industrielle des Telecommunications S.A., Paris, France

Filed Mar. 8, 1977, Ser. No. 775,685
Claims priority, application France, Mar. 11, 1976, 76 06976
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—240 **2 Claims**

1. A chopper comprising:

transistor switches, said switches being four in number and each comprising an input terminal and an output terminal and being short-circuited by a diode whose anode is connected to the output terminal and whose cathode is connected to the input terminal;

a DC supply whose first terminal is connected to the input terminals of a first switch and of a second switch and whose second terminal is connected to the output terminals of the third switch and of the fourth switch, the output terminal of the first switch being connected to the

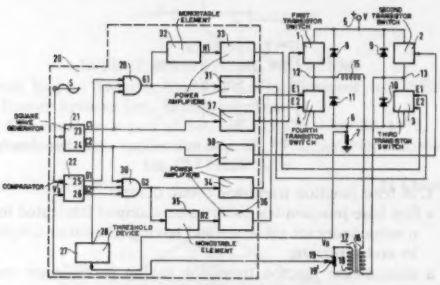
input terminal of the fourth switch, the output terminal of the second switch being connected to the input terminal of the third switch;

an output transformer comprising a primary winding and a secondary winding, said primary winding being connected in series with an inductance and thus constituting a circuit connected at one end with the output terminal of the first switch and at the other end with the output terminal of the second switch;

means for controlling the switches comprising a Schmitt trigger comparator connected to receive on a first input a first input signal constituted by an AC reference signal with a period T and on a second input a second input signal equal to a fraction of the output signal obtained on the secondary winding of the transformer, this fraction being chosen so that the second input signal will have an RMS value equal to that of the first input signal;

said comparator changing state each time the difference between the first input signal and the second input signal reaches a certain level Δv equal to a fraction of the maximum amplitude of the reference signal;

said comparator supplying a first square wave signal which is positive when the error signal obtained by the difference



between the two input signals of the comparator increases and zero when said error signal decreases and a second square wave signal in phase opposition with said first square wave signal; wherein said control means comprises means generating square wave signals with a period T from the reference signal which in combination with said first and second square wave signals coming from the comparator supply signals controlling a first group of switches comprising the first switch and the third switch and a second group of switches comprising the second switch and the fourth switch so that during each period T of the reference signal the switches of the second group will be open during the first half-period T/2;

the switches of the first group will be open during the second half-period T/2;

one of the switches of the first group during the first half-period T/2 will be commutated in phase with the second square wave signal while the other switch of the first group during the same first half-period is closed and one of the switches of the second group during the second half-period T/2 will be commutated in phase with the first square wave signal whereas the other switch of the second group during the same half-period is closed.

4,118,642

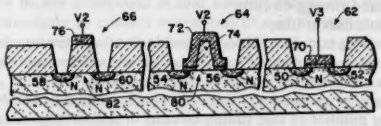
HIGHER DENSITY INSULATED GATE FIELD EFFECT CIRCUIT

William Stanley Richardson, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 590,533, Jun. 26, 1975, abandoned. This application Feb. 4, 1977, Ser. No. 765,494

Int. Cl.[2] **H03K** *5/00;* **H01L** *29/78, 27/02, 29/04*

U.S. Cl. 307—238 **6 Claims**



6. An integrated circuit comprising:

(a) a semiconductor body of a first conductivity type including first and second pairs of distinct separated regions each pair being of opposite conductivity type to said first conductivity type and being disposed in said semiconductor body, a first surface portion of said semiconductor body located between said first pair of separated regions conducting current in response to a first surface electric field intensity applied to said first surface portion and a second surface portion of said semiconductor body being located between said second pair of separated regions;

(b) a patterned layer of insulative material disposed over said semiconductor body;

(c) a first conductor means located over said first surface portion and over said second surface portion and including means for coupling to a voltage supply of a first predetermined value, said second surface portion constituting a part of a parasitic device;

(d) said first conductor means being spaced and separated from said first surface portion of said semiconductor body by a first portion of said patterned layer of insulative material, and said first conductor means being separated and spaced from said second surface portion of semiconductor body by a second portion of said patterned layer of insulative material, said first and second portions of said patterned layer of insulative material having substantially an identical thickness, said first portion of said patterned layer of insulative material including upper and side surfaces; said first conductor means including regions disposed over said upper and side surfaces of said first portion of said pattern layer of insulative material for diminishing the effective spacing between said first portion;

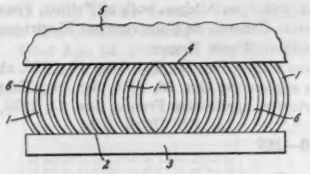
(e) said first conductor means, said first portion of said patterned layer of insulative material, said semiconductor body and said means for coupling to a voltage supply of a first predetermined value being cooperatively responsive for generating said first surface electric field intensity at said first surface portion; said first conductor means, said second portion of said patterned layer of insulative material, such semiconductor body and said means for coupling to a voltage supply of a first predetermined value being cooperatively responsive for generating a second surface electric field intensity at said second surface portion, said second surface electric field intensity being lower than said first surface electric field intensity for minimizing the possibility of turning on the parasitic device.

4,118,643

COMPLIANT MHD ELECTRODE STRUCTURE

Anthony Patrick Coppa, and Bert Zauderer, both of Merion, Pa., assignors to General Electric Company, Fairfield, Conn.

Filed Feb. 14, 1977, Ser. No. 768,641
Int. Cl.[2] H02K *45/00*
U.S. Cl. 310—11 2 Claims



1. A ceramic structure for use with a magnetohydrodynamic generator employing hot ionized gas as the working fluid, comprising:

a ceramic member having an obverse face for exposure to the said gas, and a reverse;

a thermally conductive compliance member having at least two faces, one of which faces is conductively fixed to the reverse of the ceramic member, the other of which faces is conductively fixed to

a cooling block,

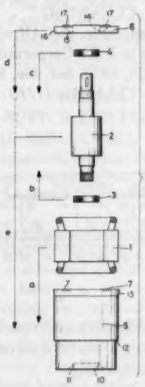
said thermally conductive compliance member comprising a plurality of curved metal strips substantially parallel to one another, one edge of each said strip comprising one face, and the other edge of each said strip comprising the other face of the compliance member.

4,118,644

ELECTRICAL MACHINERY

Siegfried Schulte, Gevelndorf, and Wilhelm Schmitt, Ringenberg, both of Fed. Rep. of Germany, assignors to Firma Schulte Elektrotechnik KG, Luedenscheid, Fed. Rep. of Germany

Division of Ser. No. 619,794, Oct. 6, 1975, Pat. No. 4,017,964. This application Dec. 15, 1976, Ser. No. 750,666
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1974, 2448699; May 28, 1975, 2523604
Int. Cl.[2] H02K *15/00*
U.S. Cl. 310—42 2 Claims



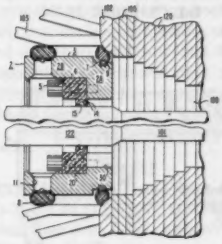
1. An electrical machinery assembly including a rotor comprising a rotor shaft and bearing means preassembled on said rotor shaft, a stator having an inner bore of given diameter, a deep drawn sheet metal housing, said bearing means on said rotor shaft having an outer diameter smaller than said given stator bore diameter, said bearing means supporting said rotor in said housing which comprises two separate deep drawn housing members of sheet metal, each of said housing members having a respective bearing seating surface produced by said deep drawing, at least one of the housing members having a stator supporting shoulder also produced by said deep drawing, whereby the stator rests against said shoulder, and wherein said housing member with the shoulder comprises at its open end a deep drawn outwardly flaring conical rim, said other housing member without the shoulder having a matching conical rim fitting into said outwardly flaring conical rim, whereby, due to said conical rims, the two housing members and with the housing members the entire assembly is automatically centered by the housing members axially pressed together.

4,118,645

DUAL POSITION AIR GAP BAFFLE ASSEMBLY FOR A DYNAMOELECTRIC MACHINE

Raymond M. Calfo, Pittsburgh; George F. Dailey, Plum Borough; Gerald R. Alkire, New Alexandria, and Arthur Mulach, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1977, Ser. No. 785,979
Int. Cl.[2] H02K *9/00*
U.S. Cl. 310—53 13 Claims



1. A dynamoelectric machine with a dual position air gap baffle comprising:

a generally tubular shaped stator assembly with a plurality of stator windings disposed therein;

a generally cylindroid rotor assembly axially and rotatably mounted within said stator with an air gap space between the outer circumference of said rotor and the inner circumference of said stator;

a dual position air gap baffle assembly rotatably mounted over said air gap on one end of said stator and for regulating air flow in said air gap in one position and the other allowing for access to said rotor assembly;

means for sealing said air gap baffle to one end of said stator.

4,118,646

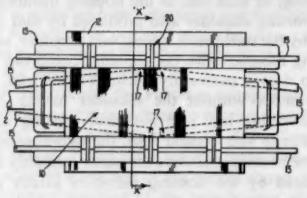
ELECTROMAGNETIC MACHINES

Francis William Fleming, and Raymond John Pethick, both of Glasgow, Great Britain, assignors to Markon Engineering Company Limited, Nottingham, Great Britain

Continuation of Ser. No. 600,198, Jul. 29, 1975, abandoned. This application Jun. 17, 1977, Ser. No. 807,882
Int. Cl.[2] H02K *9/00*
U.S. Cl. 310—58 4 Claims

1. An electromagnetic machine comprising a salient pole rotor, impellor means for directing a flow of coolant gas through the machine, an electrically-conductive winding carried on each salient pole of the rotor and formed by superimposed winding layers having a plurality of turns wound around the pertaining pole and containing conductors extending parallel to the rotor axis, and a heat pipe structure carried by each

pole, said heat pipe structure having an evaporator end embedded in said winding, a condenser end projecting into the path of flow of said coolant gas and a portion of said heat pipe structure between said ends extending laterally across a plural-



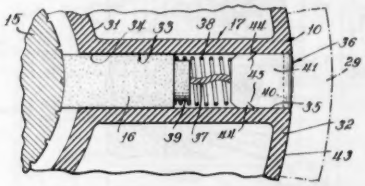
ity of said conductors with said evaporator end more remote than said condensor end from the axis of rotation of the rotor thereby permitting centrifugal force to transfer condensed fluid in the heat pipe from the condenser end to the evaporator end.

4,118,647

PREASSEMBLEABLE BRUSH ASSEMBLY

Robert A. Brenner, St. Joseph; Victor W. Cuthbert, Sodus, and Albert T. Braga, Stevensville, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 24, 1977, Ser. No. 781,011
Int. Cl.[2] H02K *13/00*
U.S. Cl. 310—239 **9 Claims**



1. In an electrical device having a wall spaced from a current-carrying element, improved means for providing an electrical connection to the current-carrying element comprising:

a brush holder carried by said wall and having a first portion, an opposite second portion, and a through channel opening at one end through said first portion and at the other end through said second portion;

a terminal having a base portion facially overlying said second portion, and a turned end received in said other end of the channel;

a pair of tangs one each on opposite sides of said terminal turned end defining resilient means for free insertion of said turned end into said channel and for biting into said brush holder as an incident of the inserted turned end being urged outwardly relative to said brush holder channel for locking said terminal end to said brush holder against displacement outwardly from said other channel end, said tangs being resiliently deformed inwardly during insertion of the turned end into said brush holder for free insertion thereof;

an electrically conductive brush movable carried in said one end of the channel and having an end portion projecting from said brush holder first portion; and

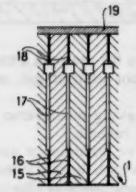
spring means between said terminal and brush urging said brush outwardly from said one end of the channel into engagement with said current-carrying element, said brush being electrically conductively connected to said terminal, said pair of tangs preventing said outward displacement of the terminal notwithstanding the outward biasing action of said spring means, said assembly of said brush holder, brush, terminal, and spring means being inserted between said wall and current-carrying element with said brush urged against the current-carrying element by said spring means.

4,118,648

SALIENT POLE OF A SYNCHRONOUS ELECTRIC MACHINE

Roger Gillet, and Jean Allégre, both of Belfort, France, assignors to Societe Generale de Constructions Electriques et Mecaniques Alsthom, Paris, France

Continuation of Ser. No. 581,994, May 29, 1975, abandoned.
This application Oct. 28, 1976, Ser. No. 736,604
Claims priority, application France, Jun. 13, 1974, 74 20591
Int. Cl.[2] H02K *1/24*
U.S. Cl. 310—269 **8 Claims**



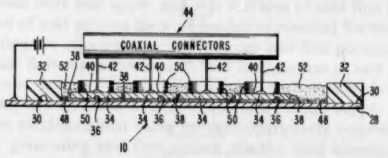
1. In a salient pole of a synchronous electric machine, said salient pole comprising: a radially internal polar body and a radially external polar shoe in the form of a single block, said block being formed of an axial stack of metal sheets, each sheet having integrally, a radially internal portion and a radially external portion, clamping means for axially clamping the metal sheets together, the radially external portion of said metal sheets being metal welded together to form an electrically conductive pole shoe, the improvement wherein said clamping means are disposed at the radially internal portion of said sheets with said sheets being unclamped between said radially internal and radially external portions and the portion of said sheets between said radially internal and radially external portions being of reduced axial thickness to form a shallow hollowed out portion extending between said radially internal portion and said pole shoe.

4,118,649

TRANSDUCER ASSEMBLY FOR MEGASONIC CLEANING

Stanley Shwartzman, Somerville, and Alfred Mayer, Plainfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 25, 1977, Ser. No. 800,276
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—337 **10 Claims**



1. A transducer assembly adapted to oscillate at a megasonic frequency for propagating a beam of ultrasonic energy into a fluid adjacent thereto comprising:

a metallic foil having a back surface, said foil having a thickness between about 5 and about 50 micrometers,

at least one transducer having one face thereof mounted adjacent to said back surface by a conductor-loaded epoxy disposed therebetween, and

insulating means disposed in the area adjacent to said back

surface and surrounding the edges of said transducer for supporting said foil and transducer in relatively fixed relationship while allowing electrical connection to the opposite face of said transducer.

4,118,650

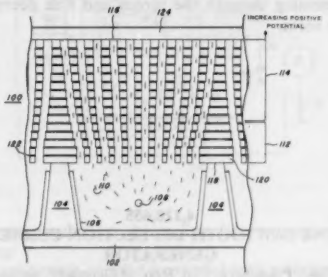
INTERNALLY SUPPORTED FLAT TUBE DISPLAY

Warner Curtis Scott, Dallas County, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 14, 1977, Ser. No. 787,393

Int. Cl.[2] H01J *29/46, 29/82*

U.S. Cl. 313—422 **7 Claims**



1. An electron beam scanning system comprising;

a gas evacuated sealed envelope;

an electron source mounted within said envelope;

a target member having a dot matrix thereon mounted within said envelope opposite said electron source;

a control stack comprising a plurality of control plates sandwiched between said electron source and said target member for controlling the flow of electrons therebetween, said control plates having a plurality of apertures formed therein, corresponding apertures of said control plates being aligned to form electron channels between said electron source and said target member;

said apertures arranged in a plurality of aperture matrixes such that the first plate of said control stack contains a matrix of apertures compressed to provide a flat portion free of aperture between adjacent sets of apertures matrixes, the remaining plates having aperture matrixes expanded such that the aperture matrix of the last plate of said control stack corresponds to said dot matrix; and

means for supporting said control stack mounted between the back plate of said envelope and said first control plate, said supporting means in contact with said flat portion.

4,118,651

INTERNALLY SUPPORTED FLAT TUBE DISPLAY

Warner Curtis Scott, Dallas County, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 14, 1977, Ser. No. 787,395

Int. Cl.[2] H01J *29/02, 29/46, 29/82*

U.S. Cl. 313—422 **11 Claims**

1. An electron beam scanning system comprising;

a gas evacuated sealed envelope;

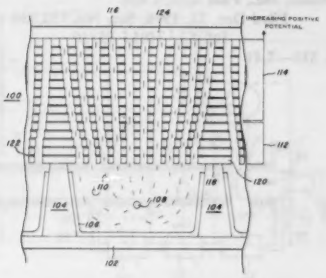
an electron source mounted within said envelope;

a target member having a dot matrix thereon mounted within said envelope opposite said electron source;

a control stack comprising a plurality of control plates sandwiched between said electron source and said target member for controlling the flow of electrons therebetween, said control plates having a plurality of apertures formed therein, corresponding apertures of said control plates being aligned to form electron channels between said electron source and said target member;

said apertures of at least one of said control plates adjacent said electron source having a large dimension along the direction that said emitted electrons have a finite transverse velocity such that a wide acceptance angle is provided thereby increasing electron transmission between said electron source and said target, said apertures having said large dimension further having a small dimension along the direction that said emitted electrons have negligible transverse velocity defining apertures having a low aspect ratio;

said apertures arranged in a plurality of aperture matrixes



such that the first plate of said control stack contains a matrix of apertures compressed to provide a flat portion free of aperture between adjacent sets of apertures matrixes, the remaining plates having aperture matrixes expanded such that the aperture matrix of the last plate of said control stack corresponds to said dot matrix; and

means for supporting said control stack mounted between the back plate of said envelope and said first control plate, said supporting means in contact with said flat portion.

4,118,652

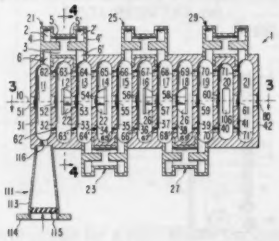
LINEAR ACCELERATOR HAVING A SIDE CAVITY COUPLED TO TWO DIFFERENT DIAMETER CAVITIES

Victor A. Vaguine, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 546,379, Feb. 3, 1975, Pat. No. 4,024,426, which is a continuation of Ser. No. 420,754, Nov. 30, 1973, abandoned. This application Mar. 14, 1977, Ser. No. 777,364

Int. Cl.[2] H01J *25/10*

U.S. Cl. 315—5.41 **4 Claims**



1. An accelerator for charged particle beams comprising wall means forming a plurality of resonant accelerating cavities, beam-passage apertures formed in said wall means between adjacent accelerating cavities, a resonant coupling cavity external to and interconnecting two of said accelerating cavities, one of said two accelerating cavities having a coupling iris in a region of its wall remote from said beam-passage aperture, said coupling iris connecting to a transmission means for injecting electromagnetic wave energy into said one accelerating cavity, said one of said two accelerating cavities having a smaller diameter than the other accelerating cavity, a first

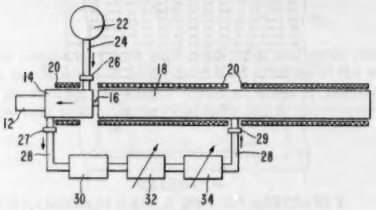
coupling passage from said coupling cavity to said one accelerating cavity, and a second coupling passage from said coupling cavity to said other accelerating cavity.

4,118,653

VARIABLE ENERGY HIGHLY EFFICIENT LINEAR ACCELERATOR

Victor Aleksey Vaguine, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 22, 1976, Ser. No. 752,936
Int. Cl.² H01J *25/10*
U.S. Cl. 315—5.41 **13 Claims**



1. In a linear accelerator for charged particles:

a substantially linear first extended acceleration circuit comprising a passageway for transmitting a beam of charged particles through said circuit in energy exchanging relation with an electromagnetic wave on said circuit traveling generally parallel to said beam,

a second acceleration circuit comprising a passage for transmitting said beam after emergence from said first circuit in energy exchanging relation with a standing electromagnetic wave on said second circuit, and

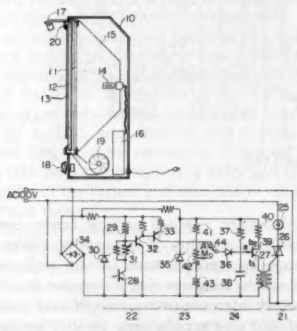
first coupling means for coupling electromagnetic wave energy into one end of said first circuit and second coupling means for coupling electromagnetic energy out from the other end of said first circuit into said second circuit.

4,118,654

AUTOMATIC LIGHT INTENSITY CONTROL FOR X-RAY FILM VIEWER

Takahiro Ohta, and Akira Muramatsu, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami ashigara, Japan

Filed Nov. 29, 1976, Ser. No. 745,754
Claims priority, application Japan, Dec. 4, 1975, 50-144831
Int. Cl.² H05B *37/02*
U.S. Cl. 40—361 **7 Claims**



1. In a photographic film viewer including a light diffuser screen, means for positioning a film adjacent one side of the screen, a housing surrounding the other side of the screen, and a light source disposed within the housing for projecting light through the screen and film, automatic light intensity control means comprising:

a. photo-detector means spaced from the screen on said one side thereof opposite the housing and oriented with respect to the plane of the film to detect only the intensity of light penetrating through the vicinity of the center portion of the screen and film and to shield ambient light therefrom, and

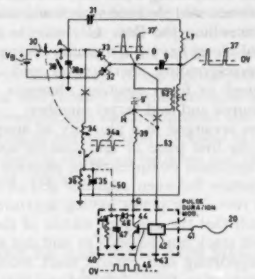
b. electrical circuit means for automatically controlling the brightness of the light source in response to an output signal from the photo-detector means, whereby the brightness of the light source is increased when the light penetrating through the screen and film decreases, and vice versa.

4,118,655

LINE SAWTOOTH DEFLECTION CURRENT GENERATOR

Jörg Wölber, Pinneberg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 24, 1977, Ser. No. 799,961
Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623599
Int. Cl.² H01J *29/56*
U.S. Cl. 315—371 **3 Claims**

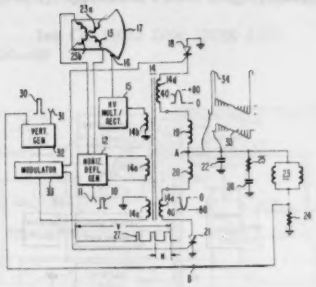


1. A circuit arrangement for generating from a supply voltage source a sawtooth deflection current through a line deflection coil, said circuit comprising a line deflection circuit including switching means operating at line frequency for periodically applying a voltage to said line deflection coil for the production of said deflection current, and modulating means adapted to be coupled to said deflection coil circuit for modulating the magnitude of the voltage across the deflection coil during the line scan period thereby modulating the amplitude of the deflection current, said modulating means including a stage operating in the switching mode, and a switch controlled by periodic pulses for alternately driving said switch into conduction and cutting it off and adjusting the duration of the controlling pulses depending on the voltage present at the modulating means output terminals; a scan capacitor, said supply voltage source being adapted to be coupled to said scan capacitor for supplying a part of the voltage applied to the line deflection coil, said modulating means providing a pulse-shaped current switched between two values to the scan capacitor an inductance means coupled to said modulations means for smoothing the switching frequency, and a winding coupled to the scan capacitor, said winding being magnetically coupled to the line deflection circuit.

4,118,656
NORTH-SOUTH PINCUSHION DISTORTION CORRECTION CIRCUIT

Wolfgang Friedrich Wilhelm Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,499
Int. Cl.[2] H01J *29/56*
U.S. Cl. 315—371 **5 Claims**



1. A north-south pincushion distortion correction circuit, comprising:

a first capacitance coupled in parallel with a vertical deflection winding;

a charging circuit coupled to said first capacitance for charging said first capacitance with respective decreasing and increasing amounts of horizontal deflection rate energy during respective first and second portions of each vertical trace interval, the charging of said first capacitance developing a generally sawtooth shaped horizontal rate voltage at a junction of said first capacitance and said winding, and the discharging of said first capacitance providing a sawtooth shaped vertical rate scanning current in said winding;

a second capacitance and impedance means coupled in circuit with said first capacitance and in parallel with said vertical deflection winding for altering the shape of said sawtooth shaped horizontal rate voltage at said junction by boosting the sawtooth voltage during the first half of each horizontal trace interval for producing on said vertical rate sawtooth current a substantially symmetrical horizontal rate parabolic current component during each horizontal trace interval for effecting north-south pincushion distortion correction.

4,118,657
CIRCUIT ARRANGEMENT FOR PROVIDING A SAW-TOOTH CURRENT IN A COIL

Attilio Farina, Via Ventimiglia 162, 10100 Torino, Italy

Filed Feb. 18, 1977, Ser. No. 770,115
Claims priority, application Italy, Apr. 7, 1976, 67804 A/76
Int. Cl.[2] H01J *29/70, 29/76*
U.S. Cl. 315—408 **3 Claims**

1. A circuit arrangement for providing a periodic saw-tooth current in a coil, such as a kinescope deflector coil (**11***a*, **11***b*) comprising:

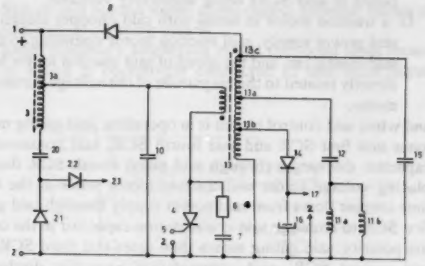
a one-way conducting device (**8**) having one end immediately coupled to a pole (**1**) of a voltage source (**1**, **2**) and the other end coupled to the coil;

a thyristor (**4**) having one terminal connected to the other pole (**2**) of said voltage source and having a control electrode (**5**) which may be coupled to an extraneous periodic pilot-pulse source which makes said thyristor conductive at the end of the trace interval of the saw-tooth cycle;

an autotransformer (**3**) having one end connected to said one pole (**1**) of the said voltage source (**1.2**), an intermediate tap (**3***a*) connected to the other terminal of said thyristor (**4**), and the other end connected to a rectifier (**22**) to provide a high D.C. voltage output for the acceleration electrode of the kinescope;

a capacitor (**10**) having one end connected to said intermediate tap (**3***a*) of said autotransformer (**3**) and to said other terminal of said thyristor, and the other end connected to said other pole (**2**) of said voltage source (**1.2**);

a transformer (**13**) having a primary winding, connecting said intermediate tap (**3***a*) of said autotransformer (**3**) to said other terminal of said thyristor (**4**), and a secondary



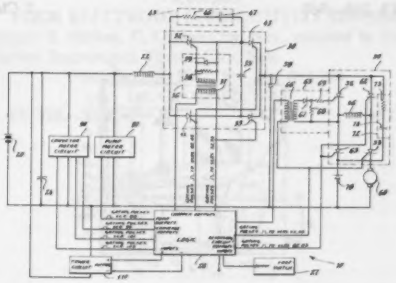
winding connecting said other end of said one-way conductive device (**8**) to said other pole (**2**) of said voltage source (**1.2**);

wherein said transformer is sized to have a primary inductance with the secondary short-circuited which, together with said capacitor (**10**) forms a time constant sufficiently great to keep the thyristor conductive throughout all the retrace interval and for the first part of the trace interval of the saw-tooth cycle.

4,118,658
CONTROL CIRCUIT FOR SHUTTLE CAR

John P. Salva, Shelton; Gregory M. Mudzinski, Stamford; John A. Mills, Norwalk, all of Conn., and Shashi B. Dewan, Toronto, Canada, assignors to Firing Circuits Inc., Norwalk, Conn.

Filed Apr. 25, 1977, Ser. No. 790,304
Int. Cl.[2] H02M *7/68*
U.S. Cl. 318—257 **19 Claims**



1. A control circuit for a mine shuttle car comprising:

A. a power supply;

B. a chopper circuit in series with said power supply, said chopper circuit being comprised of a first SCR connected in series with a second SCR, and a third SCR and a fourth SCR which are also series connected, said first and second SCRs being connected in parallel with said third SCR and a fourth SCR, so that said first SCR and said third SCR are connected to said power supply, a commutation capacitor being connected from between said first SCR and said second SCR to between said third SCR and said fourth SCR so that a pair of alternate current paths are

provided, one path being from said first SCR through said commutation capacitor and through said fourth SCR, and the other path being from said third SCR through said commutation capacitor and through said second SCR;

C. a gating means for producing a number of separate series of gating pulses one series of which simultaneously gates either said first SCR and said fourth SCR or said third SCR and said second SCR, each of said SCRs becoming conductive when gated, the frequency of said series of pulses to said SCRs being selectively variable;

D. a traction motor in series with said chopper circuit and said power supply, said traction motor operating to drive said shuttle car, and the speed of said traction motor being directly related to the magnitude of the voltage across said motor,

and when said control circuit is in operation, said gating means gates said first SCR and said fourth SCR, said commutation capacitor discharges through said gated fourth SCR thereby placing voltage across said traction motor while at the same time current flows from said power supply through said gated first SCR to recharge said commutation capacitor in the opposite polarity, said gating means then gates said third SCR and said second SCR, said commutation capacitor discharges through said gated second SCR thereby placing voltage across said traction motor while at the same time current flows through said gated third SCR recharging said commutation capacitor in its original polarity, this sequence being repeated with the frequency of said gating means' gating pulses being directly proportional to the magnitude of voltage across said traction motor.

4,118,659

ELECTRIC MOTOR FOR PHOTOGRAPHIC CAMERAS

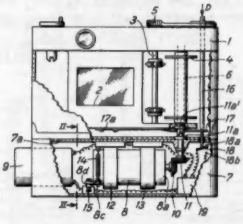
Reinhart Klemm, Zurich, Switzerland, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jan. 31, 1977, Ser. No. 763,989

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606677

Int. Cl.[2] G03B *1/18*

U.S. Cl. 318—560 **7 Claims**



1. In an electric motor attachable to a photographic camera having a main shaft for shutter rewind and film transport, said motor having an output shaft acting on said main shaft of the camera and lacking any further operational connection with the camera shutter, the improvement comprising:

said electric motor **(8)** having a housing **(7)**, a rotor, a stator, and a motor circuit and rotatably supported in said housing, means for rotating said stator oppositely to the direction of rotation of the rotor when said rotor is located into position at the end of the shutter rewind and film transport, and means for switching said motor circuit actuated by backward movement of said stator.

4,118,660

AUTOMATIC MACHINING SYSTEM

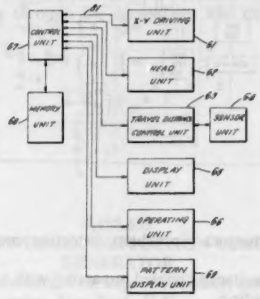
Nobuo Ohtsuki; Toshio Hayashi; Akio Imai; Yoshio Takahashi, and Noboru Hashimoto, all of Tokyo, Japan, assignors to Nippon Electric Company Ltd., Tokyo, Japan

Filed Jan. 5, 1977, Ser. No. 756,855

Claims priority, application Japan, Jan. 7, 1976, 51-1731

Int. Cl.[2] G05B *19/24*

U.S. Cl. 318—571 **2 Claims**

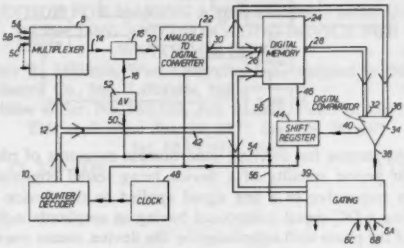


1. An automatic machining system comprising: a head unit having a combined scribing/punching tool or drill chuck, means for positioning said tool or drill chuck in the direction of the Z axis and a driving unit for rotating said chuck in drilling a workpiece; a sensor which, when subjected to pressure from the tool or drill mounted in said chuck according to the back component of force which said tool or drill receives from said workpiece when the tip of said tool or drill comes into contact with said workpiece, generates an electric signal to detect said contact and senses the variation thereof; a travel distance control unit responsive to a detection signal from said sensor for controling the travel distance of the tool or drill of said head unit in the Z axis direction in accordance with the requirement of the scribing, punching or drilling operation; an X-Y driving unit for moving and positioning said head unit in the respective directions of the X and Y axes to vary the machining position of the head unit; means for securely fixing said workpiece on a work table; a memory unit for memorizing various data; an operating unit which selects one out of the scribing, punching and drilling functions for said head unit, chooses a working pattern and feeds said memory unit with machining data including the X and Y coordinates for moving said head unit and the external dimensions and drilling depth of the workpiece; a display unit on whose screen the picture varies with the working condition of said operating unit and the machining data fed from said operating unit to said memory unit as well as the operating instruction and the kinds of data such as said X and Y coordinates and the radius to be next given as input to said operating unit are indicated; a pattern display unit on which the respective working patterns corresponding to the modes of said scribing, punching and drilling, and all the symbols in which the machining data to be fed from the operating unit to said memory unit are to be indicated are displayed in advance and the working pattern selected by the operating unit is separately indicated as express instruction to an operator; and a control unit for controlling each of the above-mentioned means in accordance with said machining data input from the operating unit to the memory unit.

4,118,661
ELECTRICAL CIRCUIT ARRANGEMENTS PARTICULARLY THOUGH NOT EXCLUSIVELY FOR ELECTRICAL BATTERY CHARGING SYSTEMS

Wladyslaw Siekierski, and Richard A. Crane, both of London, England, assignors to British Communications Corporation Limited, England

Filed Mar. 24, 1977, Ser. No. 780,957
Claims priority, application United Kingdom, Mar. 24, 1976, 11744/76
Int. Cl.[2] H02J 7/04; H03K 5/00
U.S. Cl. 320—40 **9 Claims**



1. A system for controlling the charging of an electrical battery, comprising

sampling means connected to the battery for periodically sampling the voltage of the battery, as it is charged,

means connected to convert each sampled voltage into digital form,

means for storing the successive sampled voltages after conversion into digital form,

comparing means for comparing each sampled voltage after conversion into digital form with a previously stored said sampled voltage whereby to detect when the sampled voltage is less than the previously stored sampled voltage and thereby to detect when the voltage of the battery begins to fall,

means connected to the comparing means and responsive to detection of such a fall to abruptly curtail the charging, and

means to obviate the effect of jitter in the analogue to digital conversion comprising means for changing the value of at least one of each sampled voltage and the previously stored sampled voltage with which it is to be compared by a predetermined reference increment having such a polarity as to increase the later of the two sampled voltages relative to the earlier one thereof.

4,118,662
APPARATUS INCLUDING BIFREQUENCY ELECTROMAGNETIC WAVE GENERATION MEANS FOR SYMPATHETIC EXCITATION OF DETACHED CONDUCTIVE STRUCTURES

Harold James Weber, 20 Whitney Dr., Sherborn, Mass. 01770, assignor to Harold James Weber, Sherborn, Mass.

Filed Jun. 24, 1977, Ser. No. 809,689
Int. Cl.[2] G01V 3/10
U.S. Cl. 324—3 **14 Claims**

1. Apparatus for bifrequency electromagnetic excitation of a conductive structure in a manner so as to produce nearly equal signal magnitudes throughout the structure at each of several inherently stable frequencies, wherein said apparatus includes in operative combination;

a. Generating means for generating a first radio frequency signal;

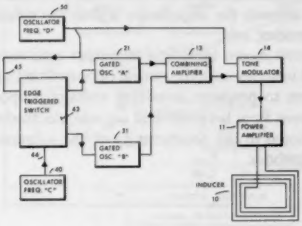
b. Generating means for generating a second radio frequency signal the frequency of which is higher than, but somewhat less than twice, the said first frequency;

c. Generating means for generating a fourth frequency signal the frequency of which is substantially lower than the said first frequency;

d. circuit coupling means having an output terminal means;

e. Switching means cooperatively connected to said circuit coupling means and said first, second, and fourth signal generating means wherein said switch is responsive to said fourth signal so as to cause the said switching means to alternatively select, in a repetative manner, between the said first and the said second signal generating means thereby producing a third signal comprising either said first or said second signal at the output terminal means of said circuit coupling means;

f. Radio frequency amplifying means the signal input means of which is operatively connected to said third signal



output terminal means so as to amplify the said alternative first and second radio frequency signals produced by said switching means;

g. Generating means for generating a fifth frequency signal operatively connected so as to modulate in amplitude the said radio frequency amplifier output;

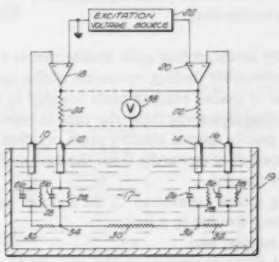
h. Inducer means operatively connected to said radio frequency amplifier means so as to provide an effective amplified third signal output coupling means wherein said inducer means is, at least, operative for emanating electromagnetic field lines at both said first and said second frequencies; and,

i. Portable direct current source of power operatively connected to the plural generating and amplifying means comprising the excitation apparatus.

4,118,663
FOUR ELECTRODE CONDUCTIVITY SENSOR

Theodore R. Barben, II, Carson City, Nev., assignor to Thomas-Barben Instruments, Carson City, Nev.

Filed Oct. 11, 1977, Ser. No. 841,254
Int. Cl.[2] G01N 27/42
U.S. Cl. 324—30 R **10 Claims**



1. In a four electrode conductivity sensor having opposing pairs of potential and current electrodes, the control and measuring system comprising:

first and second operational amplifiers each having inverting and noninverting inputs and an output coupled to a respective one of said current electrodes;

grounding means for applying a common reference potential to the noninverting input of said first operational amplifier;

voltage source means for applying a regulated excitation potential to the noninverting input of said second operational amplifier;

first and second feedback means coupling the associated potential electrode of each opposing pair directly to the inverting input of the respective first and second operational amplifiers;

means for immersing the opposing pairs of potential and current electrodes in fixed relative positions within a solution having its conductivity measured whereby the impedance in the feedback path to the inverting input of both operational amplifiers from said potential electrode greatly exceeds the impedance within the solution between electrodes; and,

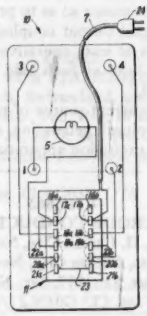
output circuit means including an output resistance element coupled in series with the output of one of said operational amplifiers to produce an output voltage proportional to the current flow between said current electrodes directly proportional to the conductivity of the solution between said electrodes.

4,118,664

ELECTRICAL TROUBLE FINDING APPARATUS

Paul Fields, 191 Palisade Ave., Yonkers, N.Y. 10703

Filed Apr. 6, 1976, Ser. No. 674,232
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—51 **5 Claims**



1. An electrical trouble finding apparatus for testing a variety of units comprising:

a case,

a manually actuated four pole double throw switch controlling the trouble finding operation of the apparatus,

a first pair of spaced binding posts coupled to the switch and protruding upwardly from the case at one end thereof,

a second pair of spaced binding posts coupled to said switch and protruding upwardly from the case at an intermediate portion thereof,

indicating means connected to the second pair of posts for indicating trouble in a unit,

a power supply, and,

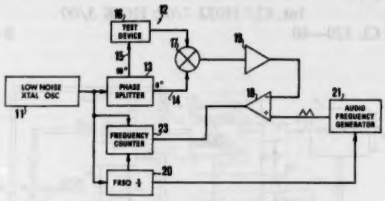
a control lever mounted on the case and coupled to the switch whereby the first pair of binding posts may be coupled to the power supply through the switch to provide power to a unit under test connected between said first pair of binding posts, and the second pair of binding posts are simultaneously in a de-energized condition so that live units may be coupled therebetween for testing.

4,118,665

TIME DOMAIN PHASE MEASURING APPARATUS

Victor S. Reinhardt, Gaithersburg, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 8, 1977, Ser. No. 858,764
Int. Cl.[2] G01R *27/00*
U.S. Cl. 324—57 R **16 Claims**



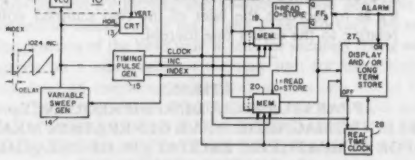
1. Apparatus for deriving time domain measures of phase and/or period stability of a device being tested comprising means responsive to a test signal applied to the device for deriving a DC signal component having an amplitude indicative of the phase shift introduced by the device, means responsive to the DC signal component for converting the amplitude of the DC signal component into a time interval indication, said converting means including means for combining the amplitude of the DC signal with the amplitude of a ramp waveform.

4,118,666

AUTOMATIC COMMUNICATION SIGNAL MONITORING SYSTEM

Albert J. Bernstein, Covina, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 4, 1977, Ser. No. 774,384
Int. Cl.[2] G01R *23/16*
U.S. Cl. 324—77 C **9 Claims**



1. A system for monitoring an RF or IF communication signal as to its power level and spectral quality throughout a selected frequency band comprising

means for periodically sweeping the spectrum of said selected frequency band,

means for detecting the peak amplitude of evenly spaced increments of said spectrum,

means for converting the peak amplitude of each increment of a sweep cycle into digital form to provide digital band sweep data,

reference memory means for storing digital band sweep data of a selected sweep cycle for use as a reference,

means for comparing digital band sweep data of subsequent sweep cycles with said reference to determine the presence of any deviation,

level detecting means for determining when any deviation detected exceeds preset tolerance levels,

temporary storage means for temporarily storing digital band sweep data of each of said subsequent sweep cycles while being processed through said comparing means and level detecting means, and

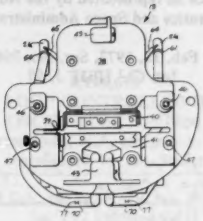
long-term store means responsive to said level detecting means for storing band sweep data from said temporary storage means when any deviation of band sweep data of a subsequent sweep cycle exceeds said tolerance levels.

4,118,667

METHOD FOR MAKING A HEAT SENSITIVE FAULT DETECTING AND INDICATING DEVICE FOR WATTHOUR METER

James W. Milligan, West Lafayette, Ind., assignor to Duncan Electric Co., Inc., Lafayette, Ind.

Division of Ser. No. 585,110, Jun. 9, 1975, Pat. No. 4,017,795.
This application Jan. 21, 1977, Ser. No. 761,467
Int. Cl.[2] G01R *1/36*
U.S. Cl. 324—110 **3 Claims**



1. A method for detecting and indicating possible faults in a watthour meter having a current stator which includes a current core and a current coil, said method comprising:

directly applying a low melting point metallic coating to the current coil of the current stator of said watthour meter; and

providing a non-conductive covering for said metallic coating that has a reduced thickness portion whereby said metallic coating penetrates said non-conductive coating at said reduced thickness portion when a current surge is received by said current coil sufficient to melt said low melting point metallic coating so that a visual indication of a possible fault is thereafter presented at said covering, said non-conductive coating being a sheath surrounding that portion of said current coil having said metallic coating applied thereto.

4,118,668

R.F. NETWORK ANTENNA ANALYZER EMPLOYING SAMPLING TECHNIQUES AND HAVING REMOTELY LOCATED SAMPLING PROBES

Roy E. Strayer, Jr., Manassas Park, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 12, 1977, Ser. No. 832,494
Int. Cl.[2] H04B *17/00*
U.S. Cl. 325—67 **10 Claims**

1. A dual channel network analyzer for testing an antenna in comparison with a reference antenna, the analyzer comprising:

first sampling means associated with each channel for respectively sampling, at a preselected rate, either first or second r.f. signals from the tested antenna and reference antenna resulting in the conversion of said signals to intermediate frequency;

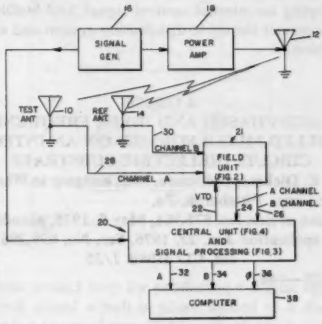
signal generating means having a first output connected in circuit with a transmission antenna which transmits signals to the tested antenna and reference antenna simultaneously;

second sampling means for sampling, at the preselected rate, a second output of the signal generating means;

phase lock loop means having an input connected to the output of the second sampling means;

voltage tuned oscillating means connected to the output of the phase lock loop means for generating a signal which establishes the preselected rate;

phase metering means having inputs respectively connected to the first and second converted signals for producing a



phase measurement of the first signal relative to the second;

first analog-digital conventing means for converting the phase measurement to a digital signal;

second and third analog-digital converting means for converting the first and second signals to digital signals representing the respective amplitudes of the signals derived from the test and reference antennas; and

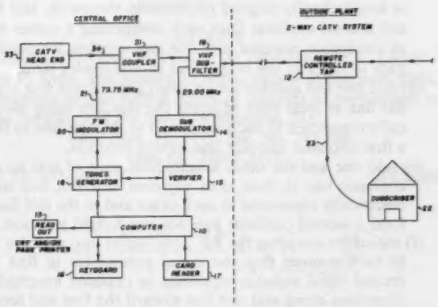
means respectively connected to the outputs of the analog-digital converting means for allowing connection of the digital phase and amplitude signals to a computer.

4,118,669

REMOTE DISCONNECT-RECONNECT TAP FOR CABLE TELEVISION SYSTEMS

Paul J. Fung, San Mateo, Calif., assignor to Premier Cablevision, Limited, Vancouver and National Cablevision, Limited, Quebec, both of, Canada

Filed Oct. 15, 1976, Ser. No. 732,571
The portion of the term of this patent subsequent to Oct. 19, 1993, has been disclaimed.
Int. Cl.[2] H04B *3/04*
U.S. Cl. 325—309 **5 Claims**



1. A remotely controlled disconnect-connect system for a

cable television distribution system having a head end feeding a cable distribution system, the disconnect-connect system including a plurality of taps disposed at diverse locations along the cable distribution system and connected to a plurality of television receivers, said taps being remote from said television receivers, each tap comprising means for receiving and detecting a time sequence of digit representing signals forming a multi-digit identification code number, each of said digit-representing signals comprising at least one tone modulated on a carrier and sent over the cable distribution system from the head end, means solely responsive to the receipt of the particular sequence of said digit-representing signals forming a predetermined multi-digit identification code associate with said tap for developing an internal control signal, and bistable switch means to connect the cable distribution system and a subscriber's television.

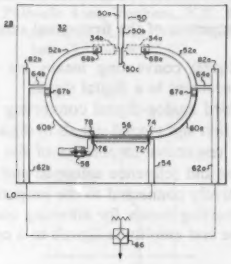
4,118,670
IMAGE PHASED AND IDLER FREQUENCY CONTROLLED MIXER FORMED ON AN INTEGRATED CIRCUIT DIELECTRIC SUBSTRATE

Lawrence E. Dickens, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 575,901, May 8, 1975, abandoned. This application Jun. 23, 1976, Ser. No. 699,296

Int. Cl.[2] H04B 1/26

U.S. Cl. 325—446 **59 Claims**



1. In a mixer system, of the type employing the heterodyne principle of operation by which the combination of an RF input signal and an LO signal generates modulation products including a desired IF signal and an undesired image signal, the combination comprising:

(a) a dielectric substrate having a layer of conductor material affixed to one face thereof,

(b) a slot transmission line having a predetermined length formed in said layer of conductor material,

(c) first and second coplanar strip transmission lines formed in said layer of conductor material and disposed respectively adjacent one and the other end of said slot line and in longitudinally aligned relationship therewith, said first and second coplanar lines each comprising a center strip of conductor material and one and another longitudinal gaps to one and the other sides of said center strip,

(d) said one and another longitudinal gaps of said first coplanar line at their ends adjacent the slot line being electrically connected to each other and to the slot line to form a first coplanar line-slot line hybrid junction,

(e) said one and the other longitudinal gaps of said second coplanar line at their ends adjacent said slot line being electrically connected to each other and to the slot line to form a second coplanar line-slot line hybrid junction,

(f) means for coupling the RF input signal into said slot line in such manner that the signal propagates in first and second equal signal components in opposite longitudinal directions along said slot line toward the first and second hybrid junctions respectively,

(g) first and second heterodyne circuit means operatively associated with the first and second hybrid junctions respectively,

(h) first and second coupling means operatively associated with said first and second coplanar lines, respectively, said first and second coupling means each including a means for coupling the LO input signal into the corresponding coplanar line and including a means for coupling the IF signal out from the corresponding coplanar line,

(i) said predetermined length of the slot line being so chosen that upon respective injection into the first and second coplanar lines of one and another LO signals which are phase displaced by 90° and upon the resultant respective generation by the first and second heterodyne circuit means of one and another image signals which are phase displaced by 180°, said slot line will intercouple the first and second heterodyne circuit means in a manner which will effectively short circuit the combination of the one and another image signals.

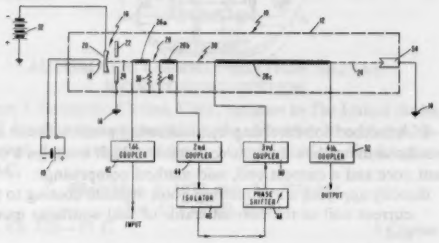
4,118,671
TRAVELING WAVE TUBE CIRCUIT

Denis J. Connolly, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 15, 1977, Ser. No. 768,795

Int. Cl.[2] H03F 3/58

U.S. Cl. 330—43 **4 Claims**



1. The combination of a traveling wave tube having a severed slow wave structure and an external signal path connecting adjacent several sections, said external signal path comprising an isolator, and a phase shifter, said external signal path having a phase vs. frequency relationship which provides a phase shift such that traveling wave tube efficiency is substantially maximized over a predetermined band of frequencies, the components in the external signal path being selected to absorb all waves passing in one direction while transmitting with minimal attenuation those waves, with frequencies within a desired operating band passing in the opposite direction.

4,118,672
ATTENUATION EQUALIZER HAVING CONSTANT RESISTANCE

Tsutomu Noguchi, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Jul. 26, 1977, Ser. No. 819,066

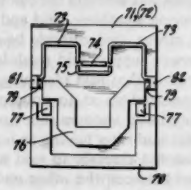
Claims priority, application Japan, Jul. 28, 1976, 51/90077; Jul. 28, 1976, 51/90078

Int. Cl.[2] H03F 3/60

U.S. Cl. 330—286 **24 Claims**

1. An attenuation equalizer having constant resistance comprising, a pair of input and output terminals, a first distributed constant line having a characteristic impedance Z_1 and an electrical length θ_1 connected to said input and output terminals of said equalizer at both of its opposite ends respectively, a first resistor having resistance R connected to said input terminal at its one side, a second resistance R connected to said

output terminal at its one side, and a second distributed constant line having a characteristic impedance Z_2 and an electrical length θ_2 connected solely to the other side of said first resistor and the other side of said second resistor at both of its opposite ends respectively.

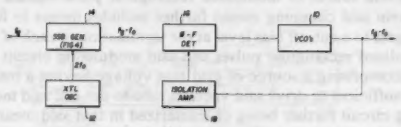


4,118,673

PHASE LOCK LOOP CONTROLLED OFFSET LOCAL OSCILLATOR SYSTEM

Erich Hafner, Tinton Falls, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 10, 1978, Ser. No. 876,771
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—2 **9 Claims**



1. A local oscillator providing an output signal having a frequency which is offset by a constant increment f_o from the frequency f_g of an input signal which is variable over a relatively wide frequency range, comprising in combination:

means for receiving said input signal;

an offset reference frequency source providing a signal having a frequency related to f_o by a predetermined fixed factor;

single sideband generator circuit means coupled to said receiving means and said reference frequency source and being responsive to respective signals provided thereby to provide a lower sideband signal f_g-f_o;

a selected one of a plurality of signal controlled variable frequency oscillators being operable to generate an f_g-f_o output signal, said plurality of oscillators each being operable over predetermined portions of said relatively wide frequency range; and

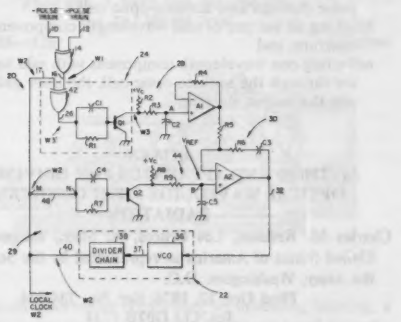
a phase lock loop for said selected one oscillator including, means coupled to said selected one oscillator for sampling a portion of said output signal, detector circuit means coupled to said single sideband generator circuit means and said signal sampling means coupled to said one oscillator and being responsive to the relative phase of said single sideband signal and the sample portion of said output signal to provide a frequency control signal for said one signal controlled variable oscillator, and means coupling said frequency control signal to said one signal controlled variable oscillator.

4,118,674

PHASE LOCKED LOOP INCLUDING ACTIVE LOWPASS FILTER

Edward R. Ball, Auburn, Wash., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Nov. 25, 1977, Ser. No. 854,853
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—17 **19 Claims**



1. A phase locked loop for producing a digital square wave output clock signal which is phase locked to a digital input signal that is a series of time slots, each of which may contain a pulse whose timing is initially controlled by a timing signal, comprising:

first means which is an oscillator means operative for producing the square wave output clock signal, said oscillator means being responsive to a control voltage for varying the frequency and phase of the clock signal;

second means which is a phase detector means producing a digital error signal which is a function of the difference between the phases of pulses in the input and output signals;

third means which is a means for integrating the digital error signal for producing an error voltage;

fourth means which is means for producing a symmetrical time-varying cyclical signal having a time-averaged value other than zero;

fifth means responsive to the cyclical signal for producing a reference voltage that is relatively constant as a function of time; and

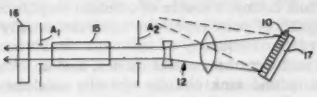
sixth means for comparing the error voltage and the reference voltage for producing the control voltage which causes the operation and frequency of the oscillator means to vary to make the frequency of the clock signal more nearly equal to an integral multiple of the frequency at which the time slots occur and the phases of pulses in the input and output signals have more nearly a fixed relationship.

4,118,675

LASER TUNING WITH AN ACOUSTO-OPTIC LENS

John P. Rahn, and Marion L. Scott, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1977, Ser. No. 783,100
Int. Cl.[2] H01S *3/10*
U.S. Cl. 331—94.5 C **10 Claims**



1. A method for tuning a pulsed laser beam in a laser having

a laser gain medium between an output element and a back reflector comprising the steps of:

passing said laser beam through substantially the entire length of an acousto-optic cell disposed between said laser medium and said back reflector;

focusing said laser beam by propagating a chirped acoustic pulse through said acoustic-optic cell;

providing spectral resolution of said laser beam into wavelength components by propagating a chirped acoustic pulse through said acousto-optic cell;

blocking all but one of said wavelength components with an aperture; and

reflecting one wavelength component with said back reflector through the acousto-optic cell, the laser gain medium and the output element.

4,118,676

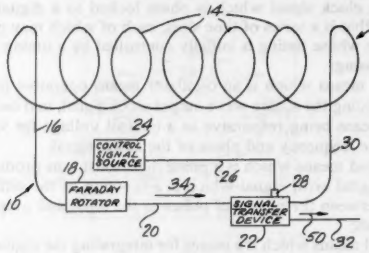
METHOD AND APPARATUS FOR DRIVING AN OPTICAL WAVEGUIDE WITH CONHERENT RADIATION

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 22, 1976, Ser. No. 734,924

Int. Cl.[2] G02B *1/14*

U.S. Cl. 332—7.51 **13 Claims**



1. Apparatus, which comprises:

means for generating a carrier signal of continuous wave coherent radiation within a first optical fiber waveguide, wherein said carrier signal generating means comprises a multi-turn fiber waveguide laser the respective ends of which are connected to said first optical fiber waveguide;

output transmission line means comprising a second optical fiber waveguide; and

means for scattering said carrier signal from said first waveguide to said second waveguide, wherein the second waveguide is aligned with respect to the scattered carrier signal so that the signal will be intercepted and travel along the optical axis of the waveguide.

4,118,677

PULSE WIDTH MODULATING CIRCUIT

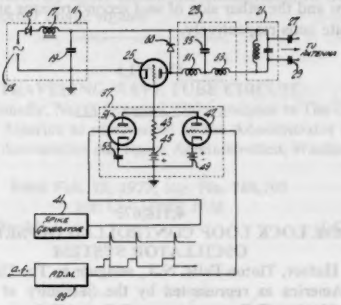
James O. Weldon, Dallas, Tex., assignor to Continental Electronics Manufacturing Company, Dallas, Tex.

Filed Dec. 5, 1974, Ser. No. 529,774

Int. Cl.[2] H03K *7/08*

U.S. Cl. 332—9 R **5 Claims**

1. In a modulating circuit of the type having an electron control device with a control electrode and connected to a constant voltage power supply means by way of a resonant output tank circuit, a source of constant amplitude rectangular pulse signals of pulse repetition rate substantially equal to the output carrier frequency of said tank circuit is connected to actuate said electron control device, and an output circuit is coupled to said tank circuit, whereby modulated subcarrier pulse signals are applied to said tank circuit without a separate radio frequency source, the improvement comprising means for clamping said control device to specified voltage levels during the occurrence of selected portions of said subcarrier pulse signals, wherein said modulated subcarrier pulse signals and said modulated rectangular pulse signals being pulse duration modulated signals and wherein the electron control device is a vacuum tube having a cathode, grid and anode electrically responsive control means, said cathode being connected to a first side of said power supply, said modulating circuit being further characterized in that said clamping means includes a low pass filter connected so as to couple said output tank circuit to the anode of said vacuum tube and to a second side of said power supply, said filter having an input series inductor with one end connected directly to said anode and a shunt capacitor connected between the other end of said series inductor and said second side of the power supply whereby high



frequency components of said subcarrier pulses pass through said shunt capacitor to clamp the anode to the voltage level of said second side of the power supply, said grid being actuated from said source of modulated rectangular pulse signals, and wherein said clamping means further includes means to force said grid to a cut-off bias level at the termination of each of said modulated rectangular pulses and said modulating circuit further comprising a source of grid bias voltage having a magnitude sufficient to drive said vacuum tube to cut-off, said modulating circuit further being characterized in that said means to force the grid to a cut-off bias level includes means for generating a voltage spike in response to the trailing edge of each modulated rectangular pulse and means responsive to each voltage spike for momentarily coupling the grid through a relatively low resistance to said source of grid bias voltage.

4,118,678

COIL RETAINING CASE

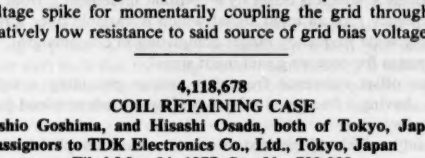
Yoshio Goshima, and Hisashi Osada, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 24, 1977, Ser. No. 799,998

Claims priority, application Japan, Dec. 22, 1976, 51-172069[U]

Int. Cl.[2] H03H *1/00*; H01F *27/02, 27/30*; H05K *5/00*

U.S. Cl. 333—70 S **2 Claims**



1. An electronic part comprising:

a plastic core holder having a rectangular bottom wall, a pair of side walls appending at right angles from opposite lengthwise edges of said bottom wall, one of said side

walls having a core retaining wall appending therefrom and extending toward the other of said side walls, and an end blocking wall appending at a right angle from a widthwise edge of said bottom wall, wherein said bottom wall, said side walls, said core retaining wall and said blocking wall are formed integrally of a plastic material and define an end access opening opposite said end blocking wall, and a side access opening between said other of said side walls and said retaining wall; and

a plurality of drum cores, each having top and bottom flanges separated by a cylindrical body section, and windings wrapped around said body section, said drum cores disposed in said core holder through said end access opening with said flanges of adjacent cores contacting each other and said bottom wall, said side walls, and said retaining wall such that said drum cores are maintained in precise position within said holder, and said entire body section and said windings of said cores are completely visible and accessible through said side access opening, said drum cores bonded and sealed in said core holder at said end opening after disposition therein such that said drum cores are securely retained in said holder;

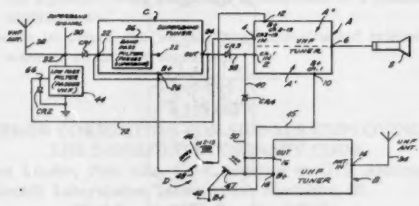
whereby the electrical coupling of adjacent cores are controlled as a result of the precise positioning of said cores within said holder, and electrical connection is made to said windings completely visible and accessible through said side access opening.

4,118,679

VHF, UHF AND SUPERBAND TUNER WITH AUTOMATIC SWITCHING

David R. Hiday, Ludlow, and Charles G. Larsen, Springfield, both of Mass., assignors to General Instrument Corporation, Clifton, N.J.

Filed May 23, 1977, Ser. No. 799,349
Int. Cl.[2] H03J 5/26
U.S. Cl. 334—1 **25 Claims**



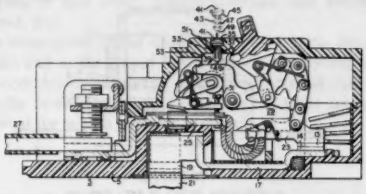
1. In a communication system for first and second signal bands and comprising first and second tuner assemblies for said first and second bands respectively and a third tuner assembly cooperable with said second tuner assembly to render the latter operative, first and second means for receiving signals for said first and second bands respectively, and means for selectively energizing (a) said first tuning assembly; and (b) said second and third tuning assemblies; the automatic switching arrangement comprising means connecting said first signal receiving means and said second signal receiving means to a node, first voltage sensitive switching means operatively connected between said node and said second tuner assembly, second voltage sensitive switching means operatively connected between said node and said first tuner assembly, third voltage sensitive switching means operatively connected between said second tuner assembly and said third tuner assembly, and means operatively connecting said selective energizing means and said first through third voltage sensitive switching means and effective (a) when said first tuner is energized to actuate said first and third voltage sensitive switching means to disconnect and to actuate said second voltage sensitive switching means to connect; and (b) when said second tuner is energized to actuate said second voltage sensitive switching means to disconnect and to actuate said first and third voltage sensitive switching means to connect.

4,118,680

CIRCUIT INTERRUPTER

Russell T. Borona, Bridgeport, Conn., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1977, Ser. No. 766,476
Int. Cl.[2] H01H 9/00
U.S. Cl. 335—176 **2 Claims**



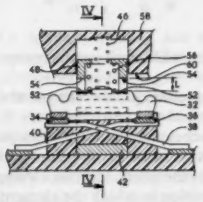
1. A circuit interrupter comprising an insulating housing, a circuit interrupter mechanism within the housing and comprising a pair of contacts operable to open and close an electric circuit, calibration means operatively connected to the mechanism for adjusting operation of the contacts, the housing having a hole aligned with the calibration means, and a plug in the hole and having a diameter slightly greater than that of the hole, whereby an inner end portion of the plug extends beyond the inner end of the hole and is expanded to its unrestrained diameter.

4,118,681

HIGH-SPEED CURRENT-LIMITING DEVICE HAVING A CONTACT RECLOSING RETARDING MEMBER

Jean-Pierre Nebon, St. Martin-le-Vinoux, and Robert Morel, Eybens, both of France, assignors to Merlin Gerin, Grenoble, France

Filed May 6, 1977, Ser. No. 794,343
Claims priority, application France, May 12, 1976, 76 14360; May 12, 1976, 76 14361
Int. Cl.[2] H01H 75/10
U.S. Cl. 335—195 **8 Claims**



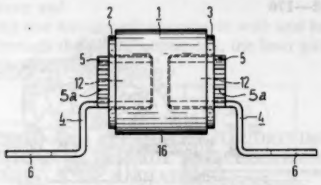
1. A current limiting device comprising a movable contact urged in the circuit closing position, electromagnetic means imparting under predetermined fault current conditions motion to the movable contact towards the circuit opening position and becoming inactive at the disappearance of said fault current conditions to allow self reclosing of the movable contact, a retarding member guided for translatory motion and of a predetermined mass, mechanically linked to said movable contact so as to permit a lost motion and an impact of the movable contact after this lost motion to move the retarding member and prevent a contact reclosing before said retarding member comes back to its original position.

4,118,682

DEVICE TO HOUSE A SURGE DIVERTER

Gerhard Lange, and Günter Schilling, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 1, 1977, Ser. No. 783,782
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618991
Int. Cl.[2] H01H *37/04*
U.S. Cl. 337—34 9 Claims



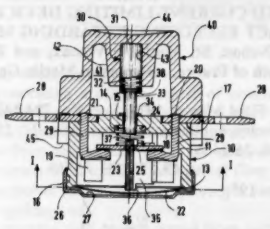
1. A device for housing a surge voltage diverter having electrodes which form cup-shaped recesses on the outside of the diverter, comprising angled metal strips each having at one end a cylindrical rolled section means for engaging one of the cup-shaped recesses in a form-locking manner.

4,118,683

RESETTABLE THERMAL SAFETY SWITCH

Gerhard Schwarz, Pforzheim, Fed. Rep. of Germany, assignor to Firma Microtherm GmbH, Pforzheim, Fed. Rep. of Germany

Filed Jun. 30, 1977, Ser. No. 811,789
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629380
Int. Cl.[2] H01H *61/00*
U.S. Cl. 337—91 10 Claims



1. A resettable thermal safety switch comprising in combination:

two separate stationary connector members over which a circuit can be laid on the switch;

a movable contact element guided for displacement between a normal position in which the element is in contact with both connector members, thereby closing said circuit, and a switched position in which the element is removed from at least one of the connector members, thereby opening said circuit;

a curved bimetallic temperature-responsive switching element which is statically bistable over a certain temperature range and which, upon reaching a predetermined temperature outside said range, pops from its normal curved shape into an oppositely curved shape, the bimetallic switching element being operatively connected to the contact element, so as to move the latter from its normal position to its switched position, when the bimetallic switching element pops from its state of normal curvature into said state of opposite curvature; and

means for manually resetting the bimetallic switching element from its popped state to its normal state, the resetting means including: a manually accessible outer member whose resetting mobility is limited by an abutment, and an inner member which is guided to advance in the direction opposite to the direction in which the bimetallic switching element is poppable; and wherein

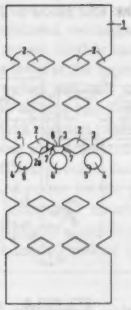
said switching element resetting means includes means for transmitting a resetting force of limited maximum value from said outer member to said inner member, by yielding until the outer member reaches its abutment, when a higher than said limited force is required to effect resetting of the popped bimetallic switching element, said force transmitting means thereby allowing the bimetallic switching member to execute a popping movement, even when the outer member is held against its abutment.

4,118,684

ONE PIECE FUSIBLE CONDUCTOR FOR LOW VOLTAGE FUSES

Klaus Möllenhoff, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 8, 1977, Ser. No. 775,439
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610262
Int. Cl.[2] H01H *85/10*
U.S. Cl. 337—296 2 Claims

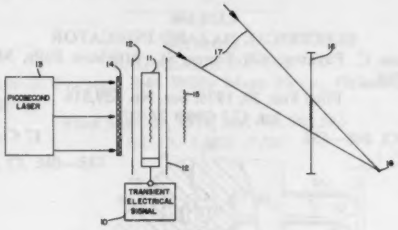


1. In a one piece fusible conductor for use in a low voltage fuse having cutouts of substantially equal cross section for narrowing the path of the current and forming current carrying isthmuses, with a hole containing a solder deposit in the vicinity of each current carrying isthmus, the improvement comprising at least one isthums located between two diamond shaped cutouts, each cutout enclosing an angle at the isthmus which is less than 70°, with the horizontal dimension of the cross section of the isthmus between cutouts being less than or equal to 1 mm, the holes and solder deposits therein being disposed adjacent said isthmus such as to leave equal current carrying cross sections standing between said holes and adjacent diamond shaped cutouts forming an isthums, the cross sections between said holes and said diamond shaped cutouts having a horizontal dimension which is smaller than or equal to 0.5 mm, the horizontal dimensions of said cross sections having approximately the relationship $2.5 \geqq E/D \geqq 0.5$ where E is the horizontal dimension of the cross section between said hole and one of said cutouts and D the horizontal dimension of the cross section between said cutouts.

4,118,685
HOLOGRAPHIC SIGNATURE PROCESSOR

Homer L. Simpson, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 26, 1976, Ser. No. 718,250
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 P **7 Claims**

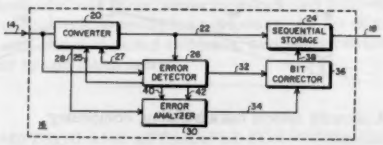


1. A holographic signal processor comprising:
an optical wavefront modulator for receiving a transient signature to be processed;
a continuous wave coherent source for illuminating said optical wavefront modulator to produce a modulated optical wavefront representative of said transient signature;
a holographic signature library for receiving said wavefront and having prerecorded thereon a plurality of signatures, each of said signatures being recorded in a discrete location;
a diffuser interposed between said modulator and said signature library whereby each recorded signature will be illuminated by portions of the optical wavefront representative of the entire signature being processed;
means for reconstructing the original reference wave when the signature being processed corresponds to a recorded signature; and
means to detect and identify the reconstructed reference wave as a recorded signature.

4,118,686
ERROR CORRECTION FOR SIGNALS EMPLOYING THE MODIFIED DUOBINARY CODE

Adam Lender, Palo Alto, Calif., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Sep. 6, 1977, Ser. No. 830,954
Int. Cl.[2] G08C *25/00*
U.S. Cl. 340—146.1 AB **18 Claims**

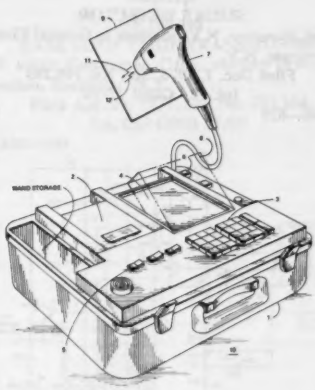


1. Apparatus for correcting single errors in digital transmission systems employing a modified duobinary code signal comprising:
conversion means having at an input the modified duobinary code signal, said conversion means providing at a first output a binary representation of the input code signal and at a second output the error differential for each bit;
error detection means having an input connected to receive the modified duobinary code, said detection means providing an error output indication at a first output and providing top extreme level and bottom extreme level indications at second and third outputs, respectively, successive extreme level occurrences establishing an error correction interval;
sequential storage means having an input connected to the first output of said conversion means, said storage means temporarily storing a limiting number of bits, said limited number being sufficiently large so as to encompass all expected error correction intervals;
error analyzing means for determining which bit in an error correction interval is most likely to be in error, said error analyzing means having as a first input the second output of said conversion means and having second and third inputs, respectively, connected to the second and third outputs of said error detection means, and having an output; and
means responsive to the output from said error detection means and to the output from said error analyzing means for complementing the bit in said sequential storage having the most likelihood of error for the error correction interval for which an error is detected.

4,118,687
PORTABLE OCR SYSTEM

Lynn D. McWaters, Garland, and Hersh B. Parekh, Plano, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Oct. 4, 1976, Ser. No. 729,530
Int. Cl.[2] G06K *5/00*
U.S. Cl. 340—146.3 ED **11 Claims**



1. A system for optically reading and recording alphanumeric data comprising; means for reading multiple line alphanumeric data in successive scans and generating a signal representative thereof, means for editing such signal and accepting the data from each successive scan represented thereby only if the data is read in a predetermined line to line sequence, and storage means for retaining information related to the sequence of the data previously read during intervals in which data is not being read and processed in the system.

4,118,688
CONFIDENCE CHECK CIRCUIT FOR BUILT-IN TEST SYSTEMS

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

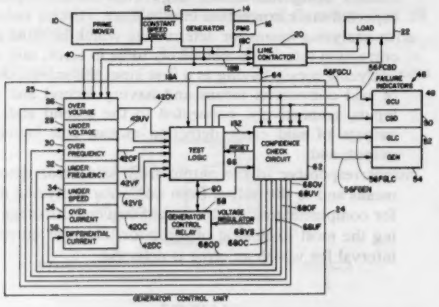
Filed Jul. 8, 1977, Ser. No. 813,998
Int. Cl.[2] G08B *29/00*
U.S. Cl. 340—516 **25 Claims**

1. A confidence check circuit for use with a built-in test system or the like having a plurality of condition sensors, test logic circuitry and a plurality of failure indication means, comprising:

a sequential check signal generator, operatively connected to the condition sensors, for sequentially applying a check signal to the condition sensors;

failure verification means, operatively connected to the sequential check signal generator and the failure indication means, for generating a reset signal when each of said check signals results in the activation of a predetermined failure indicator; and

incrementing means, responsive to said reset signal, for incrementing said sequential check signal generator.



4,118,689

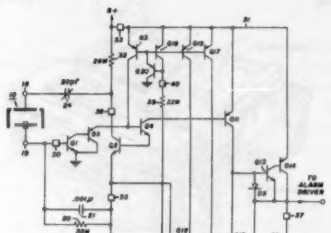
SMOKE DETECTOR

William Peil, Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,293

Int. Cl.[2] G08B *17/10*

U.S. Cl. 340—629 **19 Claims**



1. In a smoke detector network, the combination comprising:

(a) a common network terminal,

(b) an ionization smoke detector chamber having a first and a second terminal between which a high impedance exists, said impedance rising when airborne combustion products are present,

(c) a sensing circuit for sensing a change in chamber impedance by measurement of the short circuit current through the chamber comprising:

(1) an ac voltage source having one terminal connected to said first chamber terminal and the second terminal connected to said network common terminal,

(2) a current amplifier having an input, an output and a common terminal, said amplifier exhibiting an input impedance which is negligibly small in respect to said chamber impedance, said amplifier input terminal being coupled to said second chamber terminal, said amplifier common terminal being coupled to said network common terminal, and having an amplifier load coupled between said amplifier output terminal and said amplifier common terminal in which an amplified ac current appears as an ac voltage whose magnitude is dependent on chamber impedance and in turn on the density of airborne combustion products present, and

(3) voltage responsive means coupled to said amplifier output terminal for sensing said density.

4,118,690

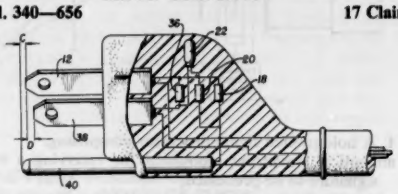
ELECTRICAL HAZARD INDICATOR

William C. Paynton, 100 Towne St., Attleboro Falls, Mass. 02763

Filed Feb. 20, 1976, Ser. No. 659,816

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—656 **17 Claims**



1. In a plug having a positive prong, a neutral prong, and a ground prong, a first fixed resistive path between said positive and said ground prongs, and an indicator means including a glow discharge indicator connected between said neutral and said ground prongs, the improvement comprising:

a second fixed resistive path between said positive and said neutral prongs; and

said neutral prong extending exterior of said plug a shorter distance then said positive and ground prongs whereby said indicator means is momentarily activated when said plug is inserted into a correctly wired electrical receptacle.

4,118,691

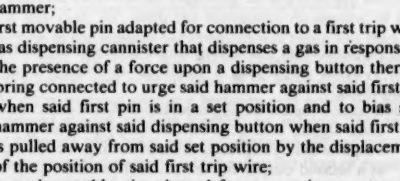
SECURITY SYSTEM FOR A BUILDING

Ruth E. Sims, 17811 NW. 14th Pl., Miami, Fla. 33169

Filed Feb. 17, 1977, Ser. No. 769,658

Int. Cl.[2] G08B *13/08*

U.S. Cl. 222—3 **1 Claim**



1. A security system for a building, comprising:

a hammer;

a first movable pin adapted for connection to a first trip wire;

a gas dispensing cannister that dispenses a gas in response to the presence of a force upon a dispensing button thereof;

a spring connected to urge said hammer against said first pin when said first pin is in a set position and to bias said hammer against said dispensing button when said first pin is pulled away from said set position by the displacement of the position of said first trip wire;

a second movable pin adapted for connection to a second trip wire; and

means for emitting sound in response to said second pin being pulled from another set position by the displacement of the position of said second trip wire, wherein said

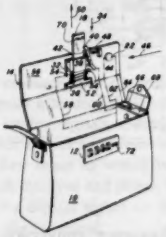
means for emitting sound includes a voltage source for emitting sound in response to the application of voltage from said source, and a spring loaded switch connected to said second pin to apply said voltage to said sound emitting means in response to said second pin being moved from said set position, whereby said first pin and said second pin may be selectively independently and concurrently displaced from said set position and said another set position respectively.

4,118,692

BAG ALARM DEVICE

Arthur B. Fitchett, 2944 Willie Mays Pkwy., Orlando, Fla. 32805

Filed Mar. 29, 1977, Ser. No. 782,503
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—542 **7 Claims**



1. A bag alarm device comprising means mounted on said bag to provide a source of direct current, alarm means mounted on said bag and electrically connected to said direct current means, pull responsive switch means mounted on a closure flap of said bag, said pull responsive switch means having an elongated external component having a logitudinal axis, said component extending outwardly from said closure flap, a portion of said external component releasably locked with a lock secured to a surface portion of the outside surface of said bag when said closure flap is overlying said surface portion thereby maintaining said bag in a closed condition, a set of contacts being maintained in an open circuited condition when said portion is locked with said lock, said set of contacts being disposed in a closed circuited condition upon the application of a pulling force applied to said closure flap in a direction of the longitudinal axis of said component tending to dispose said portion of said component further outwardly from said closure flap whilst said portion of said component is maintained locked with said lock, means to releasably maintain said set of contacts in said closed circuited condition following said application of said force, means to unlock said lock, releasing said portion therefrom without disposing said set of contacts into said closed circuited condition, said set of contacts connected to said alarm means.

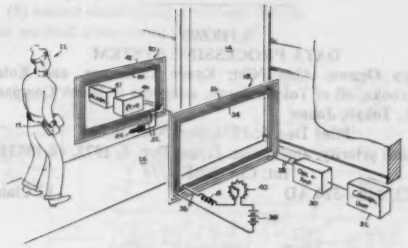
4,118,693

METHOD AND APPARATUS FOR PRODUCING UNIFORM ELECTROMAGNETIC FIELDS IN AN ARTICLE DETECTION SYSTEM

Eugene B. Novikoff, Woodbury, N.Y., assignor to Knogo Corporation, Hicksville, N.Y.

Filed May 9, 1977, Ser. No. 795,132
Int. Cl.[2] G08B *13/24*
U.S. Cl. 340—572 **21 Claims**

1. A system for detecting the unauthorized passage of specially targeted articles through an interrogation zone, said system comprising an interrogation antenna coil positioned in the vicinity of said interrogation zone, electrical oscillator means connected to said interrogation antenna for energizing same to generate electromagnetic waves in said interrogation zone, a receiver antenna coil also positioned in the vicinity of said interrogation zone, receiver means connected to said receiver antenna coil, said receiver means being operable to produce an alarm signal in response to predetermined electromagnetic disturbances caused by the interaction of a target on a protected article with the electromagnetic waves generated by said interrogation antenna coil, and a parasitic antenna



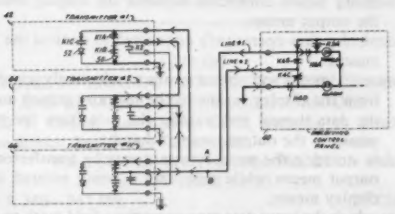
circuit comprising a parasitic antenna coil also positioned in the vicinity of said interrogation zone at a location displaced from said interrogation antenna coil, and capacitor means connected to said parasitic antenna coil to form a resonant circuit therewith, said resonant circuit having a resonant frequency substantially the same as the frequency generated by said electrical oscillator.

4,118,694

BASE LOOP CODE TRANSMITTER

Robert W. Right, Huntington, Conn., assignor to General Signal Corporation, Rochester, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,154
Int. Cl.[2] G08B *25/00*
U.S. Cl. 340—293 **8 Claims**



1. In a code transmission system which includes a central station, having a battery supply, and a plurality of station transmitters all of which are connected in a McCulloh loop circuit, having two lines, according to which an alarm may be received even though there may be a fault in the loop by using the remaining good leg of the circuit and ground return, the improvement which comprises:

at least one code relay forming a part of each of the station transmitters, said relay having three contacts, the first and second of which are in a series connection to ground from one of the lines forming said loop, the third contact of said relay being in shunt with the first and second contacts and also being connected to ground, the three contacts being so arranged that a normally closed loop is defined by the two lines when intact such that the battery supply is fed by way of the first line through said first contact, which is normally closed, and thence to said second line as a return line to the battery;

the second of said relay contacts being normally open and being operable to define a normally open loop when a fault occurs in said first line such that the positive battery supply is then connected to said second line and thence to ground; and

said third contact being normally open and being operable to likewise define a normally open loop when a fault occurs in said second line such that the positive battery supply is then connected to said first line and thence to ground;

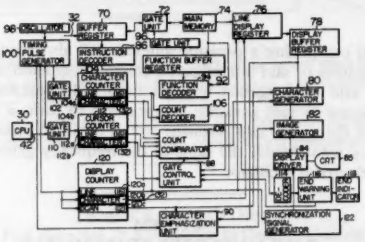
a diode in series connection with the first and second contacts of said one relay, and another diode in series connection with the third contact of the same relay.

4,118,695

DATA PROCESSING SYSTEM

Toshiya Ogawa; Akio Niki; Kazuo Uchimura, and Koichi Tsuruoka, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 5, 1974, Ser. No. 530,003
Claims priority, application Japan, Dec. 5, 1973, 48-135318
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 AD **12 Claims**



1. In a data processing system having display means including an electronic graphic display device to display input data representing a predetermined number of characters, input means to enter data into the display device and output means to output the data, the improvement comprising:

memory means connected between the display means and the output means;

control means operatively connected to control the display means;

memory means and output means to selectively transfer data from the display means to the memory means and store the data therein and transfer the data from the memory means to the output means; whereby

data stored in the memory means may be transferred to the output means while new data is being entered into the display means;

in which the input data may comprise a field mark or character to divide the predetermined number of characters into two fields of characters, the display means comprising field mark detection means to detect the field mark;

in which the input data may comprise an instruction to insert a character at a designated location in the data between the beginning of the data and the field mark, the display means comprising data insertion means to enter the designated character into the display at the designated location and shift the following characters toward the end of the data, the field mark detection means being operative to sense the input data and inhibit the insertion means if the field mark detection means detects the field mark proceded by a character; and

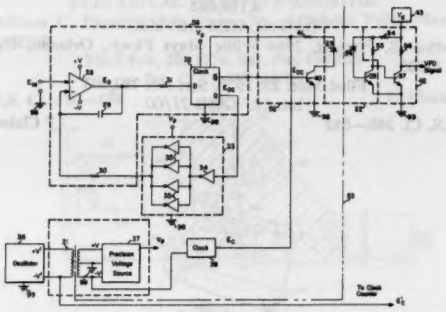
in which the input data may further comprise an instruction to delete a character at a designated location in the data between the beginning of the data and the field mark, the display means comprising deletion means to delete the character at the designated location and shift the following characters toward the beginning of the data to fill in the blank spaces produced by the deletion, the field mark detection means being operative to sense the input data and inhibit the deletion means if the field mark detection means detects the field mark from shifting characters following the field mark in the data.

4,118,696

PRECISION VOLTAGE TO FREQUENCY CONVERTER FOR USE IN A/D CONVERTER

Donald Paul Warther, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 24, 1976, Ser. No. 745,036
Int. Cl.[2] H03K *13/20*
U.S. Cl. 340—347 NT **18 Claims**



1. A voltage-to-frequency conversion circuit adapted to receive an analog signal which varies within a range between two precision voltage levels wherein said circuit comprises:

power source means to power said circuit and to supply said two precision voltage levels;

clocking means for supplying periodic clock pulses;

analog-to-duty cycle conversion means synchronized with said clocking means for converting the analog signal to a duty-cycle signal having an UP-time to DOWN-time ratio equal to the ratio between the analog signal voltage and the range between said precision voltage levels;

voltage-to-frequency pulse enable means for receiving said duty-cycle signal and coupled to said analog-to-duty cycle conversion means and to said clocking means whereby said clock pulses are enabled at the output of said voltage-to-frequency pulse enable means to form a VFO signal output during the UP-time of the duty cycle signal;

signal isolation means for electrically isolating an analog input signal from the VFO signal output, comprising:

a light emitting diode coupled between said clocking means and the collector of a switching transistor for emitting modulated light in accordance with the UP-DOWN voltage sequence at the collector of said switching transistor; and

light reception means coupled to receive the modulated light for generating a modulated electrical signal, said light reception means comprising;

a light sensor; and

a signal buffer comprising a digital power source for supplying power to said buffer means, a first transistor having its base coupled to one terminal of said light sensor and its emitter at ground potential, a first resistor coupled between said digital power source and the second terminal of said light sensor, a second resistor coupled between the collector of said first transistor and said first resistor, a second transistor having its base coupled to the collector of said first transistor and having its emitter at ground potential, and a third resistor coupled between said digital power source and the collector of said second transistor whereby said VFO signal pulse train appears at the collector of said second transistor.

4,118,697

SWITCHING ARRANGEMENT FOR CONVERTING ANALOG SIGNALS INTO DIGITAL SIGNALS AND DIGITAL SIGNALS INTO ANALOG SIGNALS

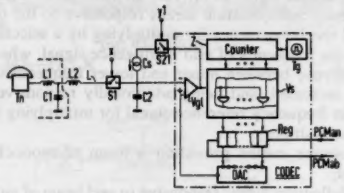
Max Schlichte, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 20, 1976, Ser. No. 751,980

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603608

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 C **5 Claims**



1. Apparatus for converting in accordance with the iterative method analog signals into digital signals and for converting digital signals into analog signals comprising:

analog comparator means comprised of a differential amplifier having a first input to which is connected a storage capacitor which receives and stores the analog signal to be converted into a digital signal or the analog signal converted from a digital signal,

first switch means for connecting a two-wire circuit to said first input of said analog comparator means said first switch means being closed for a first predetermined period for connecting said storage capacitor to said two-wire circuit for receiving the analog signal to be converted and/or delivering the analog signal converted from a digital signal, wherein during said first predetermined period said storage capacitor is charged by the analog signal to be converted and, concurrently, said storage capacitor is discharged by delivering the analog signal converted from a digital signal,

digital-to-analog converter means having an output connected to a second input of said analog comparator means,

binary register means connected to receive a reference pulse chain during conversion of the analog signal or the digital signal to be converted,

logic circuit means operable responsive to the output from said analog comparator means for controlling the coupling of the contents of said binary register means to said digital-to-analog converter means,

constant current source,

second switch means for connecting said constant current source between said first input of said analog comparator means and the output thereof, said second switch being closed after reception in said binary register of the digital signal to be converted for changing said storage capacitor to a voltage corresponding to the voltage output of said digital-to-analog converter means.

4,118,698

ANALOG-TO-DIGITAL CONVERTER RECALIBRATION METHOD AND APPARATUS

Manfred Becker, Waldstrasse 22, 6301 Rabenau, Fed. Rep. of Germany

Filed Jun. 10, 1977, Ser. No. 805,306

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2626899

Int. Cl.[2] H03K *13/20*

U.S. Cl. 340—347 CC **6 Claims**

1. The method of recalibrating and testing the accuracy of an analog-to-digital converter of the type having

(1) a signal generator for producing a linearly changing ramp reference signal whose slope can be changed,

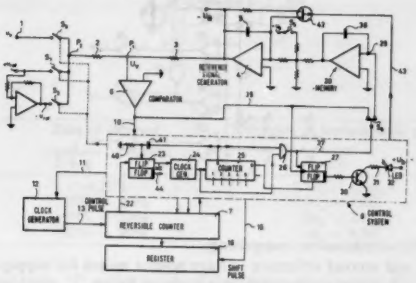
(2) an oscillator for generating clock pulses,

(3) a counter for counting clock pulses during a measuring phase of the converter,

(4) a comparator for providing an output signal when the ramp reference signal magnitude reaches the level of the analog input signal, and

(5) means establishing a voltage datum,

the method comprising the steps of



(a) allowing the linearly changing ramp reference signal to continue to be generated beyond the end of the measuring phase of the converter,

(b) at the end of the measuring phase connecting the voltage datum in opposition to the ramp reference signal as inputs to the comparator,

(c) generating a control pulse of fixed duration after the end of the measuring phase, and

(d) ascertaining whether the reference signal becomes equal in magnitude to the voltage datum within the duration of the control pulse.

4,118,699

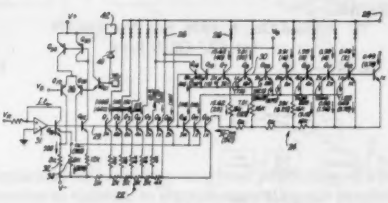
DIGITAL TO ANALOG CONVERTER WITH BINARY AND BINARY CODED DECIMAL MODES

Donald T. Comer, Los Gatos, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Feb. 14, 1977, Ser. No. 768,326

Int. Cl.[2] H03K *13/05*

U.S. Cl. 340—347 DA **27 Claims**



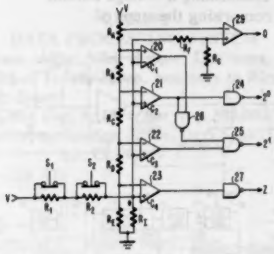
1. A digital to analog converter (DAC) adapted to receive digital input signals and to produce an output analog signal corresponding to the digital input, said converter comprising a plurality of bit circuits arranged in progressive binary order, bias circuitry for said bit circuits, and means for converting from a binary to a BCD input mode, said converting means comprising, for each of a plurality of selected bit circuits, a selectable area-scaled transistor means internal to said DAC for increasing to a BCD level the individual output current of said selected bit circuits.

4,118,700

SINGLE WIRE TRANSMISSION OF MULTIPLE SWITCH OPERATIONS

Thomas Francis Lenihan, Levittown, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 31, 1977, Ser. No. 801,660
Int. Cl.[2] G08B 25/00
U.S. Cl. 340—524 10 Claims



1. The combination comprising:

first and second reference voltage source means for supplying first and second reference voltage levels;

termination impedance means having first and second terminal means, said second terminal means coupled to said second reference voltage source means, for providing termination impedance;

a plurality of impedance means coupled in series between said first reference voltage source means and the first terminal means of said termination impedance means for causing a voltage drop across said termination impedance means;

a plurality of selectively operable switching means, each coupled across a separate one of said plurality of impedance means for selectively bypassing individual ones of said plurality of impedance means; and

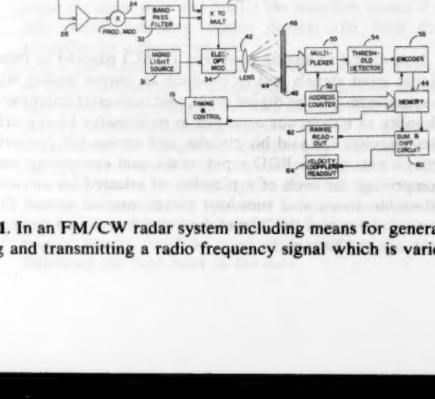
analog-to-digital converter means coupled across said termination impedance means for supplying digital signals representative of the voltage drop across said termination impedance means.

4,118,701

FM/CW RADAR SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Hans Brey, Cookville, Tenn., and Philip E. Geise, Jr., Huntsville, Ala.

Filed Oct. 8, 1976, Ser. No. 730,778
Int. Cl.[2] G01S 9/44
U.S. Cl. 343—6 R 1 Claim



1. In an FM/CW radar system including means for generating and transmitting a radio frequency signal which is varied between an upper and lower frequency at a selected rate, the improvement comprising:

reference signal means for generating a radio frequency reference signal;

side step circuit means responsive to said transmitted signal and a signal from said reference signal means for providing a signal sample, a signal differing in frequency from said transmitted signal by the quantity of said frequency of said reference signal means;

receiving means for receiving a reflection of the transmitted signal from a target and multiplying the received signal by said sample signal to provide an intelligence signal;

frequency multiplication means responsive to the output of said receiving means for multiplying by a selected multiple the frequency of said intelligence signal, whereby the difference between upper and lower frequencies present are increased, and being additionally responsive to said radio frequency reference signal for multiplying it by the same multiple;

light source means providing a beam of monochromatic light;

light deflection means responsive to said beam of monochromatic light and the output of said multiplication means for providing, as an output, a light beam which varies in angle of departure as a function of the signal frequency of output of said multiplication means responsive to said intelligence signal and providing a reference angular output responsive to said reference signal;

lens means for magnifying the angle of the angularly modulated light output of said light deflection means; and

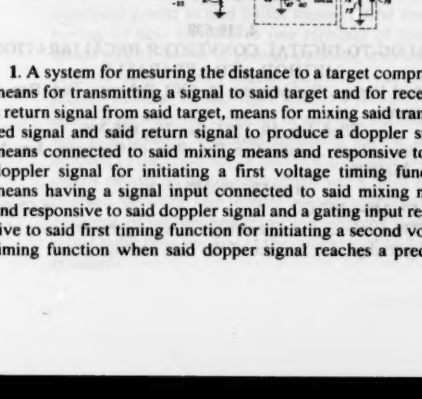
light angle detection means comprising a plurality of side-by-side frequency indicative photodetectors, each positioned to sense a discrete angular position of the light output from said lens means, and thereby the output of each is indicative of an input frequency to said light deflection means, and whereby highest and lowest frequency signals are indicated by the maximum spaced photodetectors receiving signals, and said reference angular output being identified by the photodetector receiving an output responsive to said reference signal.

4,118,702

DOPPLER DISTANCE MEASURING SYSTEM

Jacob Rabinow, Takoma Park, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 22, 1959, Ser. No. 808,277
Int. Cl.[2] G01S 7/42, 9/46
U.S. Cl. 343—7 PF 5 Claims



1. A system for mesuring the distance to a target comprising: means for transmitting a signal to said target and for receiving a return signal from said target, means for mixing said transmitted signal and said return signal to produce a doppler signal, means connected to said mixing means and responsive to said doppler signal for initiating a first voltage timing function, means having a signal input connected to said mixing means and responsive to said doppler signal and a gating input responsive to said first timing function for initiating a second voltage timing function when said dopper signal reaches a predeter-

mined value, and means connected to said means for initiating a second voltage timing function and responsive to said second timing function for producing a signal when said target is at a predetermined distance from said transmitting and receiving means.

4,118,703

PULSE RADAR APPARATUS

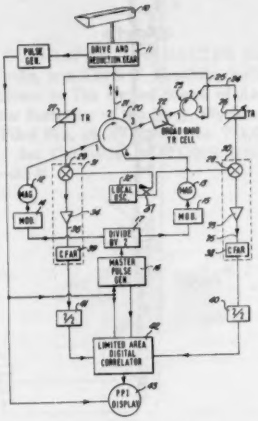
Philip David Lane Williams, Banstead, England, assignor to Decca Limited, London, England

Filed May 12, 1977, Ser. No. 796,438

Claims priority, application United Kingdom, May 18, 1976, 20484/76

Int. Cl.[2] G01S *7/30*

U.S. Cl. 343—17.2 R **13 Claims**



1. Pulse radar apparatus comprising a dispersive aerial arranged to give a directional beam, the direction of the beam with respect to the aerial in azimuth depending on the frequency of the transmitted and received signals, means for continuously rotating the aerial in the azimuth plane, transmitting means coupled to the aerial to produce pulses sequentially at a plurality of different frequencies, receiver means coupled to said aerial for receiving the radar return signals of the transmitted frequency after each transmitted pulse and separating the different frequencies to provide separate signals corresponding to the radar returns for each frequency, and display means correlating radar returns received as different frequency signals on separate channels from targets in the same azimuthal direction so that, for each target, in each aerial rotation, the different frequency transmissions provide separate signals angularly displaced by the aerial dispersion but which are correlated in the display means.

4,118,704

ELECTROMAGNETIC WAVE-ABSORBING WALL

Ken Ishino, Nagareyama; Hiroshi Yamashita, Ichikawa; Nobuyuki Ono, Chiba, and Yasuo Hashimoto, Ichikawa, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

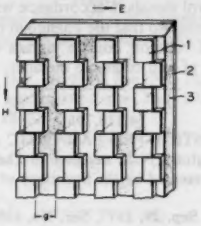
Filed Mar. 30, 1977, Ser. No. 782,779

Claims priority, application Japan, Apr. 7, 1976, 51-39070; Jul. 20, 1976, 51-86241; Jul. 21, 1976, 51-97104[U]

Int. Cl.[2] G01S *7/36;* **E04B** *1/82;* **B32B** *3/14*

U.S. Cl. 343—18 A **9 Claims**

1. An electromagnetic wave-absorbing wall comprising an array of ferrimagnetic plates affixed by one face to the surface of an electroconductive substrate arranged at spaced-apart intervals in the direction of the electric field of the electromagnetic wave and closely in the direction of the magnetic field thereof, in which the rate of interval and the thickness of ferrimagnetic plates are arranged according to the following relationship:



Rate of Interval $(\frac{g}{l+g} \times 100\%)$	Thickness of ferrimagnetic plate (d)
<20%	$0.5d_o \sim 1.5d_o$
20% ~ 40%	$0.7d_o \sim 2.0d_o$
40% ~ 60%	$1.0d_o \sim 2.5d_o$
60% ~ 80%	$1.5d_o \sim 4.5d_o$

wherein "l" is the width of the ferrimagnetic plate, "g" is the interval between the ferrimagnetic plates, "d_o" is the thickness of ferrimagnetic plate which would result in maximum attenuation at no interval between plates, and "d" is the thickness of the ferrimagnetic plate at said interval.

4,118,705

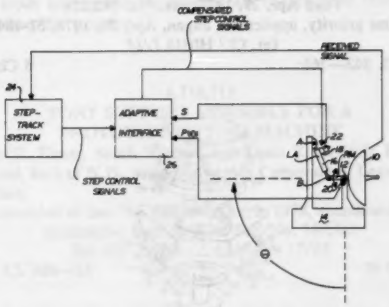
ADAPTIVE INTERFACE FOR ROTATIONAL POSITIONING DEVICE UTILIZING LINEAR ACTUATORS

Robert Fred Varley, Indialantic, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Aug. 19, 1977, Ser. No. 825,936

Int. Cl.[2] G01S *3/44;* **G05B** *19/40;* **H01Q** *3/00*

U.S. Cl. 343—100 AD **4 Claims**



1. Apparatus for providing rotational positioning of a rotatable member in response to rotation control signals supplied by a rotation control system, comprising a rotational controller including at least one linear actuator mechanically coupled to said rotatable member for controlling the rotational position thereof by adjusting the linear extension of said actuator, said linear actuator being responsive to an actuator control signal for altering the extension of said linear actuator so as to thereby control said rotational position of said rotatable member, wherein the change in rotational position produced by said actuator control signal is dependent upon the position of said rotable member; position indicator means for providing an indication of the position of said rotatable member; and interface means responsive to said indication of the position of said

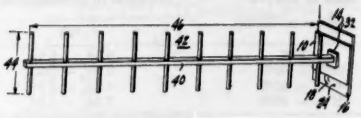
rotatable member and to said rotation control signals for providing modified rotation control signals serving as said actuator control signals, said interface means operating to modify said rotation control signals in accordance with the position of said rotatable member so that the change in rotational position produced by said rotation control signals is not dependent upon the position of said rotatable member.

4,118,706

MICROSTRIP-FED PARASITIC ARRAY

John L. Kerr, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 29, 1977, Ser. No. 838,045
Int. Cl.[2] H01Q *1/38, 19/00, 1/48*
U.S. Cl. 343—700 MS **4 Claims**



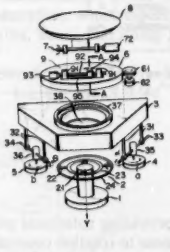
1. In an antenna, the combination comprising:
a circuit board of dielectric material having a metallic ground plane on one side thereof;
a radiating element in the form of a patch of metal etched on the opposite side of said board, said patch being continuous thereacross except for the removal of a portion in the central region thereof;
a multi-director parasitic array affixed to said circuit board at said central region;
and means for supplying an input signal to said radiating element for energizing said parasitic array.

4,118,707

GYRO STABILIZED PLATFORM FOR SCANNING ANTENNA

Takashi Yoshida, and Kenzo Kobayashi, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 29, 1977, Ser. No. 792,224
Claims priority, application Japan, Apr. 30, 1976, 51-48436
Int. Cl.[2] H01Q *1/18*
U.S. Cl. 343—765 **5 Claims**



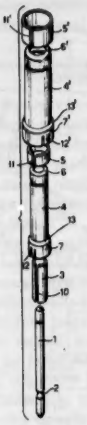
1. An antenna apparatus comprising a stationary stand, a gimbals having an inner rotary frame connected to the stationary stand to be rotated about a first horizontal axis and an outer rotary frame connected to the inner rotary frame to be rotated about a second horizontal axis normal to the first horizontal axis, an antenna supporting means attached to the gimbals to rock with the rotation thereof, an antenna mounted on the antenna supporting means, a plurality of flywheels attached to the antenna supporting means for stabilizing the antenna supporting means applying the principle of precession of gyro, a first driving mechanism for rocking the antenna in the elevational direction, a second driving mechanism for rocking the antenna in the azimuthal direction, and a third driving mechanism for shifting the center of gravity on the gimbals in a direction across the direction of the rotation of the first driving mechanism.

4,118,708

TELESCOPIC AERIAL WITH FRICTION RETAINING SLEEVES

Giorgio Lozar, and Renato Favale, both of Turin, Italy, assignors to Indesit Industria Elettrodomestici Italiana S.p.A., Rivalta (Turin), Italy

Filed May 31, 1977, Ser. No. 801,979
Claims priority, application Italy, Jun. 9, 1976, 68397 A/76
Int. Cl.[2] H01Q *1/10*
U.S. Cl. 343—901 **1 Claim**



1. In a telescopic aerial comprising:
a central cylindrical stem,
a plurality of cylindrical tubular elements of successively larger diameters coaxially surrounding said stem, and positioned such that one end of said central stem and one end of each of said tubular elements is slidably located within the immediately surrounding tubular element with the other and projecting at least partly therefrom,
a longitudinally split resilient sleeve carried at or adjacent said one end of said central stem and located between said central stem and the immediately surrounding tubular element,
a plurality of further split resilient sleeves each interposed between a respective tubular element and the tubular element which surrounds it, each of said further split sleeves frictionally engaging the two tubular elements between which it is located,
an annular radially inwardly directed lip on said other end of each tubular element, each said annular radially inwardly directed lip forming an abutment stop against which engages the split sleeve located between said tubular element and the adjacent element within it when said adjacent element is extended to its maximum extent, the improvement wherein:
each said tubular element has at its said one end, a part of greater diameter than the main part of said tubular element, said end part having at least one tab which is of one-piece with said end part projecting radially inwardly to form an abutment stop, said one end of the adjacent element within said tubular element abutting against said at least one tab when the said adjacent element is retracted fully into said tubular element.
an annular shoulder joining said end part of greater diameter to said main part of said tubular element, and

each split sleeve interposed between two tubular elements being freely slidable with respect to each of said two tubular elements between which it is interposed whereby, when each said tubular element of the aerial has been extended to its maximum extent it is prevented from further extension by the abutment of its annular shoulder against one end of the split sleeve which surrounds it and the abutment of this split sleeve against said inwardly directed lip of the adjacent surrounding tubular element.

4,118,709

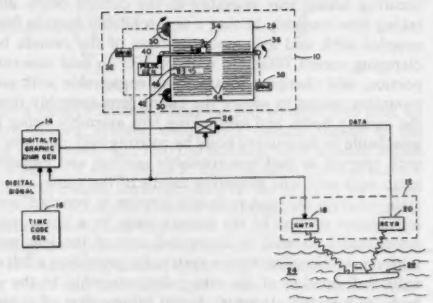
DIGITAL TO GRAPHIC CHARACTER GENERATOR

Gordon R. Cooke, and Kevin T. Franklin, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 24, 1977, Ser. No. 771,594

Int. Cl.[2] G01D 9/00; G01S 7/60

U.S. Cl. 346—33 R **10 Claims**



1. An apparatus for graphically representing one or more characters encoded in a digital signal, wherein each of said characters may be graphically represented by combining selected discrete segments included in a group of segments, wherein each of the segments of said group is required to represent at least one of said encoded characters, said apparatus comprising:

a recording means comprising a writing element and a recording medium wherein said writing element is adapted to sweep across said recording medium at selected intervals;

a timing means associated with said recording means to enable said writing element to selectively mark said recording medium during a selected series of sweeps;

means receiving said digital signal for recognizing each of the discrete segments which in combination are required to form a given one of said encoded characters, and for providing a plurality of segment pulses, each of said segment pulses identifying a different one of said recognized discrete segments;

a network of logic elements coupled to said timing means and to said segment recognition means for providing a character record signal which is coupled to said writing element to cause said writing element to selectively mark said recording medium during said series of sweeps, whereby the segments for representing each of said characters is formed.

4,118,710

ELECTROSTATIC PRINTING APPARATUS COMPRISING IMPROVED PRINTING ELECTRODE HEAD

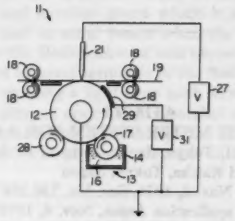
Satoru Tomita; Tamio Ohori; Shuichi Karasawa, and Wasaburo Ohta, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,361

Claims priority, application Japan, Dec. 23, 1975, 50-154323; Dec. 23, 1975, 50-154325

Int. Cl.[2] G03G 15/08

U.S. Cl. 346—153 **14 Claims**



1. An electrostatic printing apparatus comprising in combination:

a base electrode;

means for applying a developing substance including charged particles onto the base electrode;

means for positioning a recording sheet in contact with the base electrode;

a printing head including at least one shaping electrode and at least one bias electrode disposed closely adjacent to the base electrode with the recording sheet disposed between the base electrode and the printing head;

means for applying a first voltage between the base electrode and the bias electrode to urge the charged particles against the base electrode; and

means for selectively applying a second voltage to the shaping electrode to overcome the first voltage and attract only those charged particles in an area of the base electrode adjacent to the shaping electrode to the recording sheet for printing.

4,118,711

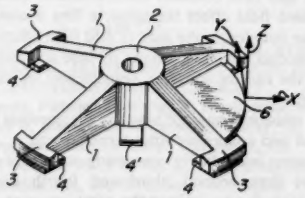
FONT SUPPORT ASSEMBLY FOR A PHOTOTYPESETTING MACHINE

Peter R. Ebner, South Nashua, and Louis E. Griffith, Hampstead, both of N.H., assignors to Itek Corporation, Lexington, Mass.

Continuation of Ser. No. 619,104, Oct. 2, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,761

Int. Cl.[2] G03B 17/6, 17/10, 17/18

U.S. Cl. 354—15 **29 Claims**



1. A font support device for supporting flat font segments having indicia referencing edge portions transverse to the

major surfaces thereof for a phototype-setting machine comprising:

a. a hub member rotatable about a vertical axis;

b. outwardly and radially extending font segment support members coupled to said hub member for horizontally supporting said flat font segments; and

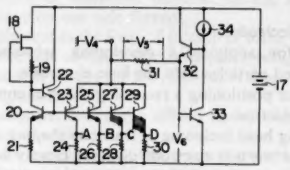
c. alignment reference shoulder portions formed upon inwardly facing surfaces of said font support members for radially referencing said edge portions of said font segments upon rotation of said hub in a direction transverse to said vertical axis of said hub member.

4,118,712

DIGITAL LIGHT METER SYSTEM FOR A CAMERA

Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1976, Ser. No. 738,264
Claims priority, application Japan, Nov. 4, 1975, 50-132238
Int. Cl.[2] G03D *7/08*
U.S. Cl. 354—23 D 4 Claims



1. In a digital light meter system for a camera including an oscillator, a counter for registering the pulses produced by said oscillator, a D/A convertor for converting the digital values registered in said counter into an analog value, and a comparator for comparing the output of said D/A convertor with an output from a light measuring and computing circuit, which latter output has a temperature coefficient K and is proportional to the sensed brightness of an object as a function of preset values of film sensitivity and either aperture opening or exposure time, the improvements characterized by said D/A convertor comprising:

(a) a constant voltage source providing a voltage having said temperature coefficient K,

(b) first, second, third, and fourth constant current sources connected in parallel, having a common output terminal, and providing output currents having ratios of 1:2:4:8, respectively,

(c) a fifth constant current source drivingly coupled to said first, second, third and fourth constant current sources and supplying a current I having said temperature coefficient K, said fifth constant current source comprising a self-biased field effect transistor, a first transistor having its base coupled to the gate of said field effect transistor and a second transistor having its base and collector coupled to the emitter and base, respectively, of said first transistor,

(d) a resistor connected between the constant voltage source and said common output terminal, and

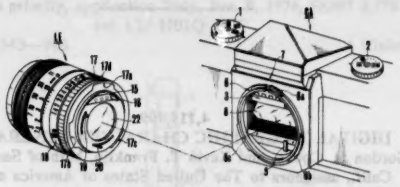
(e) means individually connecting outputs of said counter to said first, second, third and fourth constant current sources for controlling the conductions thereof, whereby the voltage drop across said resistor is proportional to the analog equivalent of the digital value registered by said counter.

4,118,713

TOTALLY OPENED F. VALUE INFORMATION INPUT SYSTEM OF LENS FOR A CAMERA WITH INTERCHANGEABLE LENSES

Hiroyashu Murakami, Tokyo; Tadashi Ito, Yokohama; Fumio Ito, Yokohama; Nobuaki Sakurada, Yokohama; Masaharu Kawamura, Hino, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 621,126, Oct. 9, 1975, abandoned. This application Apr. 7, 1977, Ser. No. 785,770
Claims priority, application Japan, Oct. 16, 1974, 49-118952
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—23 D 10 Claims



1. In a camera system comprising a camera body and an interchangeable photo-taking lens assembly, said camera body having a lens mount portion for mounting said taking lens assembly and lens mounting means adapted here for fixedly securing taking lens assembly to the camera body, and said taking lens assembly having a non-rotatable portion for being coupled with said lens mount portion of the camera body, a clamping means rotatable with respect to said non-rotatable portion, said clamping means being engageable with said lens mounting means to secure the taking lens assembly fixedly to the camera body, and said taking lens assembly being fixedly attachable to the camera body by rotating said clamping means with respect to said non-rotatable portion and engaging the same with said lens mounting means of the camera body at a state wherein the non-rotatable portion is coupled with said lens mount portion of the camera body by a linear operation substantially parallel to an optical axis of the lens assembly with no rotational motion; a system for providing a full open F value information of the taking lens assembly to the camera body as a coded electrical digital information of *n* bits, said system comprising:

means for receiving a coded mechanical digital information of said *n* bits corresponding to the full open F value of the taking lens assembly and for converting said mechanical digital information into the coded electrical digital information of said *n* bits, said receiving and converting means being fixedly disposed at said lens mount portion of the camera body and having *n* switch members so as to provide the full open F value information of the taking lens assembly as the coded electrical digital information of said *n* bits when actuated by mechanical means for providing said full open F value information as the coded mechanical digital information of said *n* bits; and

mechanical means for providing the full open F value information of the taking lens assembly to said receiving and converting means as the coded mechanical digital information of said *n* bits, said mechanical providing means being fixedly disposed on said non-rotatable portion of the taking lens assembly and having K mechanical signal members, wherein K represents an integer from 0 to *n*, to determine the ON-OFF condition of each of said *n* switch members on the camera body side according to said full open F value of the taking lens assembly, said mechanical signal members having *n* setting positions each respectively corresponding to each of said *n* switch members on the camera body side and being able to provide 2^n different mechanical digital information by combination of said respective number (K) of the signal members being disposed and their positions, and being adapted to actuate

said switch members according to the full open F value of the taking lens assembly when the taking lens assembly is attached to the camera body;

whereby the full open F value information of the taking lens assembly is provided to the camera body as coded electrical digital information of *n* bits through the actuation of said receiving and converting means on the camera body side by said providing means on the taking lens assembly side at the time of attaching of the taking lens assembly to the camera body.

4,118,714

LIGHT METERING SYSTEM FOR A PHOTOGRAPHIC CAMERA

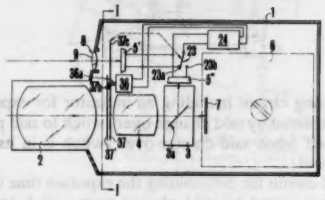
Hidekazu Okajima, and Hideto Iwama, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 596,291, Jul. 16, 1975, abandoned. This application Jan. 27, 1977, Ser. No. 763,078

Claims priority, application Japan, Jul. 18, 1974, 49/82980

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—31 **45 Claims**



1. For a camera having a housing and an objective lens, an exposure control system, comprising optical means in the housing for passing light into the housing, light sensing means in the housing for responding to light incident thereon and for producing an output corresponding to the level of light incident thereon, electrically variable diaphragm means coupled to said sensing means and responsive to said sensing means for establishing an aperture at the objective in response to the output of said sensing means, and setting means coupled to said sensing means and said diaphragm means for setting said sensing means into a first mode in which the output of the sensing means responds only to light from the objective lens when the diaphragm opening is within a first range, and for setting said sensing means into a second mode in which the output of the sensing means responds only to light through said optical means when the size of the aperture is within a second range.

4,118,715

ELECTRONIC PHOTOFLASH HAVING A TERMINAL BOARD

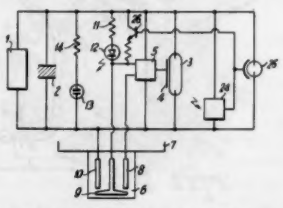
Yuzo Tsuruta, Tokyo, Japan, assignor to Sunpak Corporation, Tokyo, Japan

Filed Feb. 9, 1977, Ser. No. 767,120

Claims priority, application Japan, Sep. 6, 1976, 51-118864[U]

Int. Cl.[2] G03B *15/05*

U.S. Cl. 354—33 **5 Claims**



1. In an electronic photo flash for use in cameras having a flash socket, said flash socket having a plurality of receiver terminals of which at least two are normally in a short-circuited condition, and which emits light by discharging with a flash tube the electric charge of a storage capacitor which is charged from a power source, said electronic photo flash having a control circuit which measures the brightness of an object being photographed issuing a stop signal to stop the discharge of said flash tube when said brightness has reached an optimum level for taking the photograph, wherein the improvement comprises a terminal board plugged into the flash socket of said camera, terminals mounted on said terminal board and brought into contact with the receiver terminals in the flash socket of said camera, indicator means connected to a terminal of said terminal board which is shorted to another terminal of said terminal board when the terminal board is plugged into the flash socket of said camera by the two normally shorted receiver terminals in the flash socket, said indicator means emitting a light upon such terminal shorting, and a switching element connected in parallel with said indicator means and conducting temporarily said stop signal from the control circuit whereby said indicator means is temporarily turned off.

4,118,716

PHOTOGRAPHIC MODE SELECTION DEVICE FOR A CAMERA

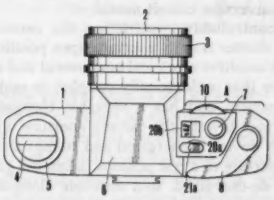
Masayuki Suzuki, Tokyo; Nobuaki Sakurada; Tadashi Ito, both of Yokohama; Masayoshi Yamamichi, Kawasaki, and Hiroyashu Murakami, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1977, Ser. No. 781,347

Claims priority, application Japan, Mar. 31, 1976, 51-35738

Int. Cl.[2] G03B *7/08, 17/00;* **G01D** *13/00*

U.S. Cl. 354—38 **9 Claims**



1. A photographing mode change-over device for a double priority mode camera which is equipped with a shutter release button and which is capable of controlling the degree of exposure either in a shutter speed priority automatic exposure mode or in a diaphragm priority automatic exposure mode as desired by the photographer, said device comprising:

a photographing mode change-over means which is provided on said camera for shifting from one of said photographing modes to the other and is disposed at a position which enables the photographer to operate the change-over means with a finger while he is pressing a shutter release button with another finger of the same hand.

4,118,717

AUTOMATIC FILM-EXPOSURE CONTROL SYSTEM AND ELECTRICAL POWER SUPPLY MEANS FOR A PHOTOGRAPHIC CAMERA

William E. Shoupp, Pittsburgh; Walter V. Bratkowski, McKeesport, and Dirk J. Boomgaard, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 380,178, Jul. 17, 1973, abandoned. This application Jun. 10, 1977, Ser. No. 806,118

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—43 **9 Claims**

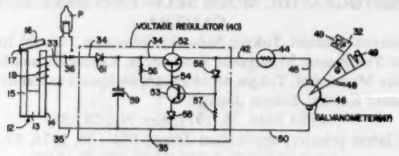
1. In combination with a photographic camera having an aperture and a shutter that is moved from an aperture-closed position to an aperture-open position by a shutter-actuating

mechanism to expose film within the camera, a system for controlling the film exposure under various ambient light conditions and means for energizing and operating said exposure-control system comprising:

a mechanically actuable electric generator having (a) means which defines a magnetic circuit, (b) a component that is movable along a predetermined path which produces a concomitant change in the field strength of said magnetic circuit, and (c) conductor means disposed in inductive relationship with the field of said magnetic circuit and adapted, in response to the actuation of said electric generator and the movement of said component along said path, to produce a group of voltage pulses of varying magnitudes and durations with the initial voltage pulse being of the longest duration and having a peak value greater than any of the other voltage pulses,

means for mechanically actuating said electric generator and the movable component thereof,

electric circuit means operable to convert the voltage pulses produced by the actuated electric generator into a voltage which is of smaller magnitude than said initial voltage pulse and is substantially maintained at a predetermined value for a period of time longer than the duration of said initial voltage pulse,



conductor means connecting the electric generator with said voltage-conversion circuit means,

means for controllably constricting the camera aperture, when the shutter is in its aperture-open position, comprising a light-sensitive electrical component and a galvanometer device that is electrically coupled to said light-sensitive component and has a movable elongated member which swings toward the camera aperture when the galvanometer device is energized and swings away from the camera aperture to a rest position when the galvanometer device is de-energized, said movable elongated member constituting an integral part of and being directly actuated by the galvanometer device,

conductor means electrically connecting the voltage-conversion circuit means to said light-sensitive component and galvanometer device,

said light-sensitive component being disposed at a location such that it is exposed to and senses ambient light and is operable thereby to control the amount of electric current flow through the galvanometer device and regulate the displacement of the movable elongated member, when the galvanometer device is energized, and thus the size of the aperture opening and the resulting film exposure.

4,118,718

MEASURING AND CONTROL SYSTEM FOR SINGLE LENS REFLEX

Werner Hahn, and Heinz Schulze, both of Dresden, German Democratic Rep., assignors to VEB Pentacon Dresden Kamera-und Kinowerke, Dresden German Democratic Rep.

Filed Jun. 21, 1977, Ser. No. 809,050

Int. Cl.[2] G03B *17/20*

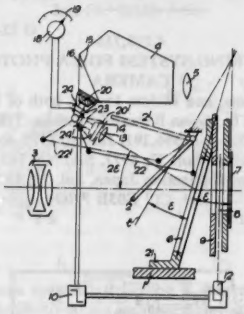
U.S. Cl. 354—55 **2 Claims**

1. An exposure measuring and control system for a single-lens reflex camera having an optical path for light to pass therethrough for defining an image at a film gate and a reflex mirror pivotable between a viewing position and position out of the optical path during exposure, comprising:

(a) a partly translucent mirror arranged in the optical path,

(b) a photo electric cell mounted for movement into a first position for receiving light reflected by said reflex mirror with the latter in the viewing position and into a second position for receiving light reflected from said partly translucent mirror,

(c) a change-over switch which switches to a first position when said photo electric cell is in its first position and to a second position when said photo electric cell is in its second position,



(d) a measuring circuit including an indicator for exposure times, connected by said change-over switch to said photo electric cell when said change-over switch is in its first position, and

(e) a control circuit for determining the exposure time of the camera, connected by said change-over switch to said photo electric cell when said change-over switch is in its second position.

4,118,719

MICROSCOPE ATTACHMENT CAMERA

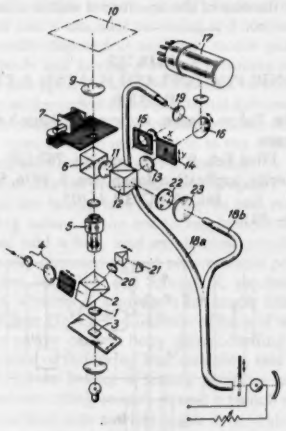
Herbert Leiter, Wetzlar, and Günter Reinheimer, Biebertal, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,852

Claims priority, application Fed. Rep. of Germany, May 5, 1976, 2619853

Int. Cl.[2] G03B *17/48*; G02B *21/00*

U.S. Cl. 354—79 **10 Claims**



1. In a microscope-attachment camera having an observation beam with a system for measuring the brightness of an object detail and with markings for indicating at least the detail meter-

ing-field and the image-field of the camera in said observation beam, the improvement:

a metering field-marking (**14**) positioned on a first plate and an image field-marking (**22**) positioned on a second plate, said first plate defined by a metering field-stop (**14**), said metering field-marking and said image field-marking differing in shape and size (**14, 22**) and being simultaneously reflected into said observation beam.

4,118,720

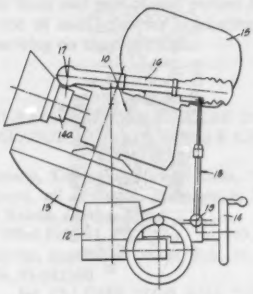
VIEWFINDER EYEPIECE LEVELING DEVICE

Robert E. Gottschalk, Los Angeles, Calif., assignor to Panavision, Incorporated, Tarzana, Calif.

Filed Jan. 3, 1977, Ser. No. 756,191

Int. Cl.[2] G03B *29/00*

U.S. Cl. 354—81 **4 Claims**



1. In combination, a camera having a viewfinder eyepiece device mounted thereon to pivot adjacent its forward end about a horizontal axis, a camera support mechanism having a base and a tilting support member, means mounting said tilting support member on said base for movement about an axis parallel to said horizontal axis, means for securing said camera to said tilting supporting member, means for moving said tilting support relative to said base, and a link pivotally connected at one end adjacent the rear end portion of said viewfinder eyepiece device and pivotally connected at the other end to said base whereby movement of said rear end of the viewfinder eyepiece device is minimized during tilting movement of said support member and camera.

4,118,721

X-CONTACT DEVICE FOR BLADED SHUTTER

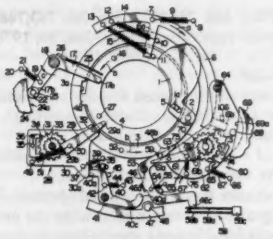
Akihiko Hashimoto, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1977, Ser. No. 768,080

Claims priority, application Japan, Feb. 16, 1976, 51/15592

Int. Cl.[2] G03B *15/03*

U.S. Cl. 354—147 **3 Claims**



1. A shutter assembly comprising concentric opening and closing rings and a plurality of blades pivotally coupled to both rings;

charging means for biasing both said rings in a first direction;

diaphragm means for engaging a projection on said opening ring to set a desired shutter opening;

means for restraining a projection on the closing ring when the diaphragm is in the full open setting;

adjustable governor means for releasing the restraining means after a settable predetermined time interval;

an X-switch contact and means responsive to the end of said time interval for actuating the X-switch to enable initiation of a flash operation during the time that the bladed shutter begins to close.

4,118,722

OPTICAL SYSTEM FOR INDICATION IN THE VIEWFINDER OF SINGLE-LENS REFLEX CAMERA

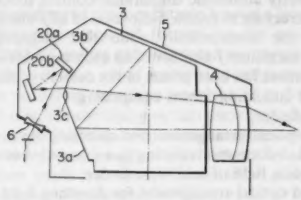
Sei Matsui, Chiba, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 20, 1976, Ser. No. 734,246

Claims priority, application Japan, Oct. 28, 1975, 50-146053

Int. Cl.[2] G03B *19/12*

U.S. Cl. 354—155 **1 Claim**



1. An optical system built in the viewfinder of a single-lens reflex camera for directing an information carrying light beam from an indication element provided on the object side of the body of said viewfinder to an eyepiece, comprising:

(a) a pentagonal Dach-prism having a light transmitting portion provided on a surface between the third reflective surface of said prism, where a light beam from an objective mounted on the camera undergoes its third reflection following the reflection by the Dach-surface, and the non-reflection surface adjacent to and lying above said third reflection surface;

(b) a first reflective member positioned in the vicinity of said light transmitting portion, and on the non-reflection surface side thereof, so as to reflect the information carrying light beam of said indication element in a direction away from said pentagonal Dach-prism;

(c) a second reflective member provided in a position spaced further from said prism than that of the light path between said indication element and said first reflective member, to reflect the information carrying light beam reflected by said first reflective member to intersect the beam segment incident upon the first reflective member and then to said eyepiece after passing through said light transmitting portion,

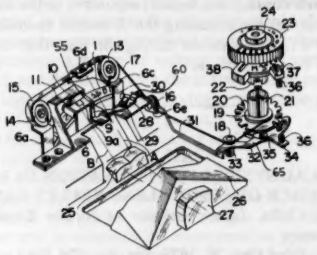
said first reflective member and said second reflective member being separated from each other and air intervening therebetween; and

(d) a negative lens member provided in the light path extending from said indication element to said first reflective member and being integral with the body of the viewfinder, thereby to seal the interior of the viewfinder from its exterior, said indication element being located exterior of said viewfinder.

4,118,723
CAMERA INDICATING MEANS

Keiji Yamazaki, Sakai, and Mamoru Katsuragi, Izumi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Nov. 28, 1977, Ser. No. 855,084
Claims priority, application Japan, Nov. 29, 1976, 51-160360[U]
Int. Cl.[2] G03B *17/20, 19/12*
U.S. Cl. 354—155 **11 Claims**



1. Indicating means for an exchangeable lens type camera which is selectively settable to operate in either a diaphragm priority automatic shutter speed control mode or a shutter speed priority automatic diaphragm control mode and which includes structure to enable indication of an *f*-number representative of the automatically controlled diaphragm aperture when the maximum *f*-number of an exchangeable lens mounted on said camera has been preset in the camera operating mechanism, said indicating means comprising:

a view-finder;

a first optical arrangement for directing light to introduce visible information relating to a selected shutter speed into the view field of said view-finder;

a second optical arrangement for directing light to introduce visible information relating to a set *f*-number into the view field of said view-finder;

a manually operable exposure mode selector for selectively setting said camera for operation in said diaphragm priority automatic shutter speed control mode and in said shutter speed priority automatic diaphragm control mode; and

a shutter element movable between a first position in blocking relationship to the light of said first optical arrangement to prevent information relating to a preselected shutter speed from being introduced into the view field of said view-finder and a second position out of said blocking relationship to permit introduction of said information relating to a preselected shutter speed into said view field, said shutter element being coupled to said exposure mode selector for movement thereby into said first position when said exposure mode selector is operated to set said camera in said diaphragm priority automatic shutter speed control mode and into said second position when said selector is operated to set said camera in said shutter speed priority automatic diaphragm control mode.

4,118,724
CAMERA WITH SELECTOR FOR EITHER ELECTROMAGNETIC RELEASE OR MECHANICAL RELEASE

Hiroshi Ueda, Nara; Takayoshi Miyamoto, and Masatake Niwa, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchimachi, Japan

Filed Sep. 28, 1977, Ser. No. 837,139
Int. Cl.[2] G03B *17/38, 17/42*
U.S. Cl. 354—*266* **11 Claims**

1. In a camera including:

a shutter mechanism;

a manually operable release member;

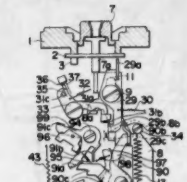
a mechanical release device for releasing said shutter mechanism for an exposure in response to the depression of said release member;

an electromagnetic release device for releasing said shutter mechanism for an exposure in response to the depression of said release member;

manually operable release modes setting means; and a release modes selecting device coupled with said setting means and said release devices for selectively enabling either one of said release devices in accordance with the setting of said setting means, the improvement comprising:

electromagnetic release initiating means movable from a first to a second position in response to the depression of said release member, for operating said electromagnetic release device;

mechanical release initiating means movable along a predetermined path in response to the depression of said release member for operating said mechanical release device;



first locking means for locking said electromagnetic release initiating means when said modes setting means is set for mechanical release mode; and

stroke restricting means for restricting the stroke of the movement of said mechanical release initiating means when said modes setting means is set for electromagnetic release mode, said mechanical release device being coupled with said mechanical release initiating means so as to be operated for release of said shutter mechanism only when said mechanical release initiating means is moved beyond the restricted stroke, and the stroke of said electromagnetic release initiating means from the first to the second position being such that said electromagnet release initiating means reaches the second position in response to the depression of said release member before said movement of said mechanical release initiating means is restricted by said stroke restricting means.

4,118,725
SHUTTER SPEED DISPLAY FOR VIEWFINDER OF FIXED POINT EXPOSURE METER CAMERA

Hiroshi Kurei, and Tetsuji Shono, both of Kawagoe, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1977, Ser. No. 763,748
Claims priority, application Japan, Jan. 30, 1976, 51-9458[U]
Int. Cl.[2] G03B *17/20*
U.S. Cl. 354—289 **1 Claim**

1. A combined shutter speed display and fixed point exposure meter for a camera viewfinder comprising:

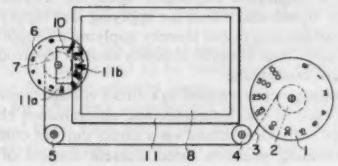
a rotatable shutter speed setting dial;

a plurality of aligned indicator elements positioned along a side of the viewfinder picture frame;

a rotatable shutter speed display dial operatively coupled to the setting dial for rotation therewith, the peripheral edge of the display dial bearing appropriate shutter speed markings and extending into the viewfinder picture frame adjacent said indicator elements, the rotational direction

of said display dial and translation direction of said indicator elements as seen through said viewfinder being the same as the rotational direction of said setting dial; and

a mask surrounding said viewfinder, said mask having a



plurality of aligned holes through which said indicator elements are visible and a pair of spaced tabs extending inwardly from said side of said picture frame opposite a center one of said holes for bracketing the set shutter speed marking on the display dial.

4,118,726

EXCHANGEABLE LENSES FOR USE IN INTERNAL LIGHT MEASURING TYPE SINGLE LENS REFLEX CAMERAS

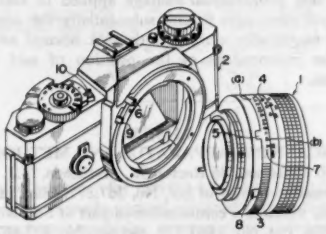
Yoshio Kuramoto, Toyonaka; Hiroshi Ueda, Nara, and Kyozo Uesugi, Izumi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 17, 1977, Ser. No. 769,832

Claims priority, application Japan, Feb. 19, 1976, 51-17564; Dec. 12, 1976, 51-141500

Int. Cl.[2] G03B *17/00, 9/02, 7/00*

U.S. Cl. 354—289 **17 Claims**



1. A series of exchangeable lenses for use in a single lens reflex camera, each of said exchangeable lenses comprising:

a lens barrel including at least one lens and a diaphragm;

a fixed index on the outer surface of said lens barrel;

a diaphragm setting ring including *f*-number graduations ranging from a maximum *f*-number to a minimum *f*-number of said exchangeable lens, said ring being rotatable to a plurality of positions for aligning any one of said *f*-number graduations with said index to be set to a desired *f*-number;

first means projecting from said ring and spaced a predetermined first distance, common to each exchangeable lens of said series, from said minimum *f*-number graduation in the rotational direction of said ring such that the amount of the rotation of said first means with said ring set to a desired *f*-number from the minimum *f*-number corresponds to the step difference between the minimum and the desired *f*-number; and

second means projecting from said ring and spaced a predetermined second distance from said maximum *f*-number graduation in said rotational direction, said second distance being dependent on the value of the maximum *f*-number of each exchangeable lenses of said series such that said second means is at a position dependent on the value of the maximum *f*-number of said exchangeable lens with said ring set to the maximum *f*-number.

4,118,727

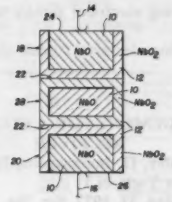
MOX MULTI-LAYER SWITCHING DEVICE COMPRISING NIOBIUM OXIDE

Paul R. Laplante, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 9, 1977, Ser. No. 831,849

Int. Cl.[2] H01L *29/12*

U.S. Cl. 357—10 **6 Claims**



1. An electrical threshold switching device comprising in combination:

a first and second metal oxide device, each consisting of a single crystal metal oxide substrate having a layer of polycrystalline oxide material formed on the outer surface thereof and having an exposed substrate region devoid of said polycrystalline oxide material, contiguously placed together to define an active interface of polycrystalline material wherein switching occurs during operation while providing a pair of exposed substrate regions, one on each device wherein said single crystal substrate is comprised of niobium oxide and said polycrystalline material comprises niobium dioxide and

electrical contact means applied to said pair of exposed substrate regions.

4,118,728

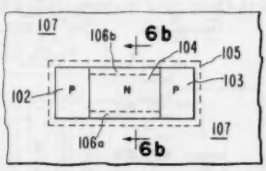
INTEGRATED CIRCUIT STRUCTURES UTILIZING CONDUCTIVE BURIED REGIONS

Robert Berry, Cupertino, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Sep. 3, 1976, Ser. No. 720,467

Int. Cl.[2] H01L *29/80*

U.S. Cl. 357—22 **9 Claims**



1. A junction field effect transistor formed in a pocket of semiconductor material comprising:

the pocket of semiconductor material being a region of semiconductor material electrically isolated from underlying semiconductor material by a laterally extending PN junction, and electrically isolated from adjacent semiconductor material by insulating material, said PN junction defining the bottom of the pocket and said insulating material defining at least part of the walls of the pocket,

a source region of first conductivity type formed in the pocket adjacent a first portion of the walls of the pocket,

a drain region of first conductivity type formed in the pocket

adjacent a second portion of the walls of the pocket, said second portion being nowhere adjacent to said first portion,

a gate region of opposite conductivity type formed in the pocket between the source region and the drain region and separating the source region from the drain region,

a conductive buried region of first conductivity type disposed between the gate region and a portion of the walls of the pocket, said conductive buried region extending along the walls of the pocket from the source region to the drain region,

means for applying electrical signals to the gate region to thereby vary the conductivity of the conductive buried region,

means for applying electrical signals to the source region, and

means for applying electrical signals to the drain region.

4,118,729

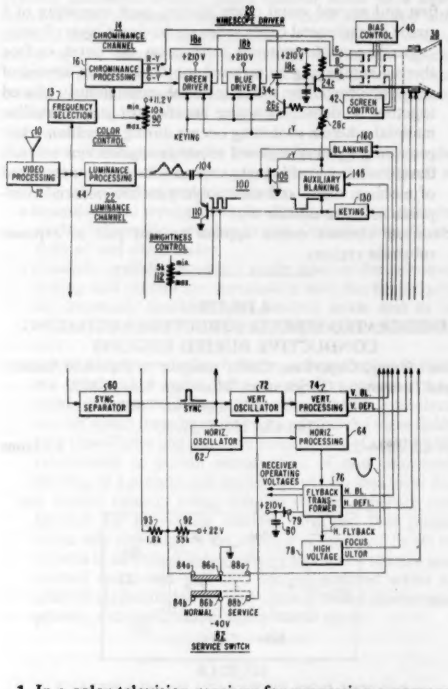
SET-UP ARRANGEMENT FOR A COLOR TELEVISION RECEIVER

Robert Loren Shanley, II, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,065

Int. Cl.[2] H04N 9/62

U.S. Cl. 358—10 **12 Claims**



1. In a color television receiver for processing a composite color video signal containing luminance, chrominance and synchronizing signal components, said receiver including a luminance channel for processing said luminance component; a chrominance channel for processing said chrominance component; a plurality of amplifier stages responsive to luminance and chrominance components processed by said luminance and chrominance channels; a color image reproducing device having a plurality of electron beam intensity control electrodes responsive to said luminance and chrominance components and direct current coupled to respective outputs of said amplifier stages; deflection means associated with said electron beam apparatus for providing horizontal and vertical scanning of said device, said deflection means including means for providing a periodic signal having time intervals representative of image trace and retrace intervals and a frequency synchronized by a synchronizing signal input thereto; means for deriving from said periodic signal a receiver operating supply voltage of a magnitude dependent upon the frequency of said periodic signal; and means for applying said supply voltage to said amplifier stages and thereby applying a proportional voltage at said direct coupled intensity control electrodes; control apparatus comprising:

switching means coupled to a direct voltage control terminal of each of said luminance and chrominance channels and said deflection means via a direct current connection for providing selective direct current control of said luminance and chrominance channels and said deflection means, said switching means having

a first position for selectively rendering said luninance and chrominance channels and said deflection means normally operative in a normal mode of operation of said receiver; and

a second position for selectively rendering said luminance and chrominance channels inoperative to couple said luminance and chrominance components, and for rendering said deflection means inoperative to provide scanning of said device in one direction, to permit adjustment of said device in a service mode of operation of said receiver;

means responsive to said composite color video signal and operative independent of said luminance and chrominance channels for separating said synchronizing signal component; and

means coupled to said separating means for supplying the separated synchronizing signal component to said periodic signal providing means as said synchronizing signal input independent of the position of said switching means, whereby said derived receiver operating supply voltage and said proportional voltage applied to said intensity control electrodes exhibit substantially the same respective magnitudes during both said normal and service modes independent of the position of said switching means.

4,118,730

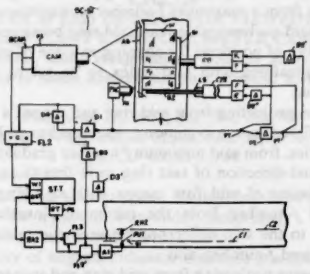
SCANNING APPARATUS AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08841

Continuation-in-part of Ser. No. 267,377, Mar. 11, 1963, abandoned, which is a continuation-in-part of Ser. No. 626,211, Dec. 4, 1956, Pat. No. 3,081,379, and Ser. No. 477,467, Dec. 24, 1954, abandoned. This application May 18, 1972, Ser. No. 254,710

Int. Cl.[2] H04N 7/18

U.S. Cl. 358—93 **23 Claims**



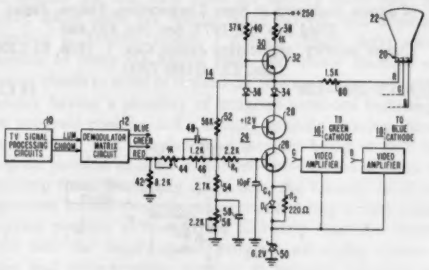
1. An automatic inspection apparatus for determining the location of a selected image in an image field whereby said selected image is optically differentiatable from the surrounding area of the image field, said apparatus comprising:

(a) a beam device,
(b) means for moving the beam of said device for line scanning said image field,
(c) means for generating an output signal on said line scanning means,
(d) means for modulating said output signal in accordance with variations in the image field scanned by the beam of said beam device,
(e) means for causing the beam of said beam device to scan said selected image and to be modulated in response to radiation from said selected image,
(f) means for providing an inflection in said outputs signal when said beam scans across said selected image, and
(g) an analyzing circuit operable to receive said output signal,
(h) said analyzing circuit including means for generating a code responsive to said inflection in said output signal,
(i) said generated code being indicative of said selected image in the image field scanned.

4,118,731
VIDEO AMPLIFIER WITH SUPPRESSED RADIO FREQUENCY RADIATION

Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 760,864
Claims priority, application United Kingdom, Jul. 19, 1976, 30005/76
Int. Cl.² H04N *9/18, 5/68, 5/14;* **H03K** *5/00*
U.S. Cl. 358—65 **23 Claims**



1. A video amplifier for driving an image reproducing device having an intensity control electrode, comprising:

a semiconductor amplifier responsive to video signals including a range of signal amplitudes, said range including a first portion capable of causing said amplifier to operate within a region of low current conduction and a remaining portion capable of causing said amplifier to operate within a region of relatively higher current conduction, said amplifier having a nonlinear conduction characteristic in said region of low current conduction and having associated input and output circuits;

means for coupling said output circuit to said intensity control electrode;

a degenerative feedback network coupled from said output circuit to said input circuit;

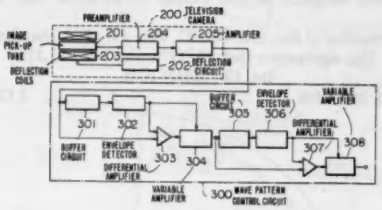
means for providing degenerative feedback for said amplifier; and wherein said feedback means comprises

an impedance common to said input and output circuits, said impedance comprising a semiconductor device having a nonlinear conduction characteristic in a region of low current conduction for providing degenerative feedback for said amplifier, when operating in said region of low current conduction in response to said first video signal amplitude portion, in an amount sufficient to impede cut-off of said amplifier; and for providing degenerative feedback of a lesser amount for said amplifier when operating within said region of relatively higher current conduction in response to said remaining video signal amplitude portion.

4,118,732
APPARATUS FOR DETECTING A SURFACE FLAW OF A MATERIAL AT HIGH TEMPERATURE

Isamu Ichijima, Kisarazu; Seiichi Watanabe, Kimitsu, and Kazuo Miyagawa, Kisarazu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 15, 1977, Ser. No. 768,822
Int. Cl.² H04N *7/18*
U.S. Cl. 358—101 **5 Claims**



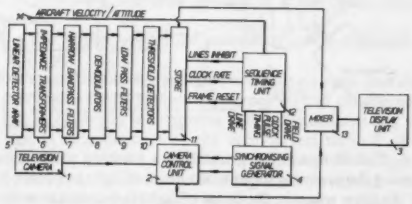
1. An apparatus for detecting a surface flaw in a moving material to be measured wherein the radiation energy from the surface of said material at high temperature is detected by means of photoelectric detector so as to detect the surface flaw of said material, which comprises:

(1) a television camera having an image pick-up tube for detecting the radiation energy from the surface of said material;
(2) a shutter means provided before said image pick up tube of said television camera to obtain the rest image of the moving material by said television camera;
(3) a shading control circuit receiving the output of said television camera for correcting the output fluctuations within an image pick up plane of said image pick up tube of said television camera; and
(4) a defect recognizing means receiving the output of said shading control circuit for recognizing defects in the material.

4,118,733
SURVEILLANCE ARRANGEMENT INCLUDING A TELEVISION SYSTEM AND INFRARED DETECTOR MEANS

Alan Elmer Sarson, and William James Rowley Clark, both of Great Baddow, England, assignors to Elliott Brothers (London) Limited, London, England

Filed Mar. 30, 1976, Ser. No. 671,449
Int. Cl.² H04N *7/18, 5/33;* **H01J** *31/49*
U.S. Cl. 358—109 **11 Claims**



1. An airborne surveillance arrangement comprising an aircraft carrying a television system including television camera means for viewing a target area of the surface over which the aircraft is to fly lying ahead of said aircraft and a television display arrangement coupled to said television camera means for displaying the target area viewed by said television camera

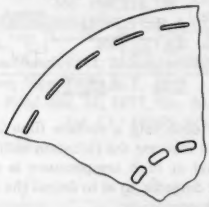
means, and an array of individual infra-red detectors imaged into space to view part of said target area to provide brighten-up signals for said display to highlight heat emitting targets in said display target area, said infra-red detector array being imaged into space with a directivity which is fixed in the direction of the flight path of said aircraft.

4,118,734

OPTICAL VIDEODISC WITH VARIABLE WIDTH TRACKS

Gijsbertus Bouwhuis; Josephus Johannes Maria Braat, and Bernardus Antonius Johannus Jacobs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 442,397, Feb. 14, 1974, abandoned. This application Oct. 29, 1976, Ser. No. 737,321
Int. Cl.[2] H04N *5/76*
U.S. Cl. 358—128 **2 Claims**



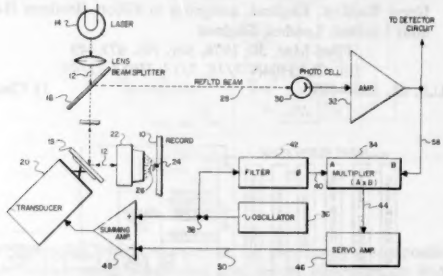
1. A record carrier of the type on which information is recorded in the form of an optical structure on substantially concentric tracks in the form of regions and intermediate areas, said regions having different optical properties than the intermediate areas and the lands between the tracks, the improvement wherein the width of the tracks increases as the radial positions of the tracks decrease.

4,118,735

SYNCHRONOUS DETECTION TRACKING OF VIDEO DISC

Richard L. Wilkinson, Torrance, Calif., assignor to MCA Disco-Vision, Inc., Los Angeles, Calif.

Continuation of Ser. No. 510,163, Sep. 30, 1974, abandoned. This application Feb. 9, 1977, Ser. No. 766,928
Int. Cl.[2] H04N *5/76*
U.S. Cl. 358—128 **2 Claims**



1. Circuit means for generating a tracking error signal for biasing the scanning motion of a beam of light in a servo system of the type wherein the beam of light is focused to a spot and the spot of light is used to optically track and simultaneously read a channel of information stored on a video disc, the video disc having a sequence of bumps alternating with the planar surface portion of the video disc for causing a reflective-scattering sequence of the spot as it runs along the track, the system having means for rapidly scanning the spot of light across the information channel and having means for collecting and detecting the light reflected from the video disc, said circuit means comprising:

an oscillator for generating a driving signal to the means for scanning to produce an oscillatory scan pattern;

a phase filter coupled to said oscillator for shifting by a fixed amount the phase of the driving signal generated by said oscillator to substantially match the phase of the oscillatory scan pattern;

multiplier means for combining the phase-shifted oscillator signal with the output of the means for detecting to effect a linear multiplication of the two applied signals and thereby produce a multiplier output signal whose polarity represents the direction of the deviation of said scan pattern relative to the information channel and whose average magnitude is proportional to the magnitude of the displacement of said scan pattern from the center of the information track, the minimum magnitude occurring when the spot is centered in the tracks; and

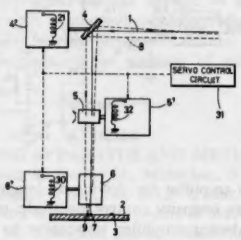
a summing amplifier in which the driving signal generated by said oscillator is combined with the output of said multiplier means for driving the means for scanning.

4,118,736

METHOD OF AND APPARATUS FOR CONTROLLING THE OPTICAL READING OF RECORDED INFORMATION

Hitoshi Okada, Yotsukaido, and Yohsuke Naruse, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 28, 1977, Ser. No. 837,465
Claims priority, application Japan, Oct. 1, 1976, 51-120607
Int. Cl.[2] G11B *7/00*
U.S. Cl. 358—128 **14 Claims**

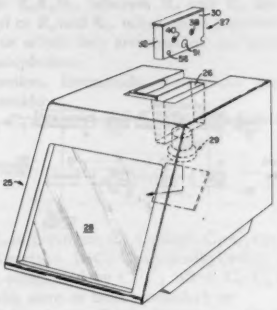


1. In a process for optically reading information from a record medium wherein a main beam of radiant energy is transmitted to impinge upon and scan said record medium whereat said main beam is modulated with said information while scanning said record medium and an additional beam of radiant energy is transmitted to impinge upon said record medium, both said main beam and said additional beam passing through a common objective lens for focussing of said beams, said process including detecting said main beam after said main beam is modulated with said information, adjusting the transmission path of at least said main beam in response to the detection of said main beam, detecting said additional beam after said additional beam impinges upon said record medium, and adjusting the focussing of said main and additional beams by moving said objective lens relative to said record medium in accordance with the detection of said additional beam, the method of minimizing defocussing of said main beam in the event of a transmission path adjustment thereof comprising further adjusting the focussing of said main and additional beams by further moving said objective lens as a function of the adjustment of said transmission path of said main beam in response to said detection of said main beam.

4,118,737
AUTOMATIC SYSTEM FOR HANDLING AND PROCESSING PHOTOGRAPHIC FILM STRIPS

Melvin T. Chambers, Arlington, and Herbert L. Hardy, Sudbury, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,426
Int. Cl.² G03C *11/00*
U.S. Cl. 352—130 **5 Claims**



1. Apparatus for use with a film handling system comprising a supply spool and a take-up spool, the spools being operable to wind a film strip from the supply spool onto the take-up spool and rewind the film strip from the take-up spool onto said supply spool upon the spools being driven, said apparatus including an electric motor, a friction clutch, drive means operable to drive the spools from said motor through said friction clutch to wind or rewind the film strip, a programming member having a plurality of program positions including a first program position and a second program position, means responsive to said programming member being in said first program position to cause motor and drive means to wind the film strip from the supply spool onto the take-up spool and responsive to said programming member being in said second program position to rewind the film strip from the take-up spool onto the supply spool, program advancing means to cause said programming member to advance between said program positions in succession, and torque responsive means for sensing an electrical characteristic of said electric motor and for causing said advancing means to advance said programming member from at least one of said first or second program positions to the next successive program position in response to said electrical characteristic maintaining a predetermined level for a predetermined time interval, said predetermined level of said electrical characteristic corresponding to slippage of said friction clutch.

4,118,738
TIME BASE ERROR CORRECTOR

Walter Arnstein, San Jose, Calif., assignor to American Videonetics, Sunnyvale, Calif.

Continuation of Ser. No. 618,624, Oct. 1, 1975, abandoned. This application Jun. 8, 1977, Ser. No. 804,725
Int. Cl.² H04N *5/04, 5/76, 7/00, 5/78*
U.S. Cl. 358—148 **20 Claims**

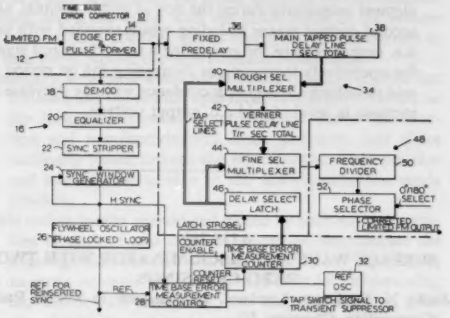
11. A method of correcting time base errors occurring in recurrent impulse trains carrying information on the leading edges of the impulses thereof and wherein each said train has a detectable beginning, said method comprising the steps of:

detecting the actual time of arrival of the beginning of each said impulse train;

generating as a time base an average expected time of arrival of beginning by averaging over multiple recurrent trains;

passing a said train through a digital delay line having a plurality which periodically regenerates each passing pulse;

digitally counting the difference in time between actual time of arrival and expected time of arrival of the beginning of each said train, the count thus reached being a measure of



the time base error wherein each count unit corresponds to a tap of said delay line;

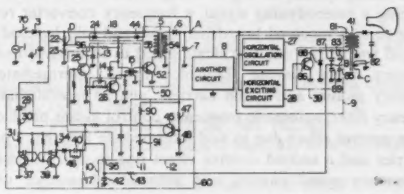
for each said train, selecting a tap of said delay line with said digit count; and

outputting said train from said delay line via said selected tap to thereby correct any time base error.

4,118,739
SWITCHING REGULATOR FOR TELEVISION RECEIVER FOR GENERATING A STABILIZED D.C. SUPPLY VOLTAGE FOR OPERATING THE VARIOUS TV CIRCUITS

Kunio Umehara, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 17, 1977, Ser. No. 769,834
Claims priority, application Japan, Feb. 20, 1976, 51-17065; Feb. 20, 1976, 51-17067
Int. Cl.² H04N *5/44*
U.S. Cl. 358—190 **9 Claims**



1. A switching regulator for use in a television receiver, comprising:

(a) a d.c. power source for generating a non-stabilized d.c. voltage;

(b) chopper means including a switching element, said chopper means being operatively turned on and off alternately for periodically interrupting said non-stabilized d.c. voltage in accordance with the turn-on and turn-off of said switching element to produce an interrupted voltage;

(c) rectifying means for converting the interrupted voltage from said chopper means into a d.c. output voltage;

(d) a horizontal deflection circuit supplied as an operating voltage therefor with said d.c. output voltage for operatively generating a horizontal flyback pulse;

(e) first control means supplied with said horizontal flyback pulse for generating a first control signal corresponding to the horizontal deflection frequency of said horizontal flyback pulse, and for preventing said first control signal

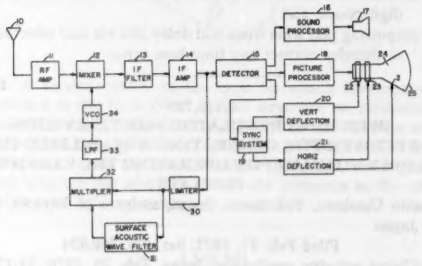
from being generated when the supply of said horizontal flyback pulse is stopped; and

(f) second control means for rendering said switching element on and off at said horizontal deflection frequency of said first control signal during the supply of said first control signal thereto and for holding said switching element inoperative during the stop of said first signal, said second control means including means supplied with said d.c. output voltage for generating a second control signal for operatively increasing or decreasing the on period of said switching element in accordance with the decrease or increase in level of said d.c. output voltage.

4,118,740
SURFACE WAVE AFC DISCRIMINATOR WITH TWO ZERO CROSSINGS

Jouke N. Rypkema, Lombard, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 21, 1977, Ser. No. 817,653
Int. Cl.[2] H04N *5/50*
U.S. Cl. 358—195 **7 Claims**



1. In a television tuning system, for receiving a broadcast signal having frequency-spaced sound and picture carriers, said tuning system having a voltage controlled oscillator producing a heterodyning signal, a frequency converter responsive to said received broadcast signal and said heterodyning signal translating said broadcast signal to an intermediate frequency signal having frequency-spaced intermediate frequency picture and sound carriers, and an intermediate frequency filter; automatic frequency control means producing a first control effect due to said intermediate frequency picture carrier and a second control effect due to said intermediate frequency sound carrier, said automatic frequency control means comprising:

a surface acoustic wave filter having a frequency-dependent phase characteristic such that a quadrature phase shift is imposed upon signals at said intermediate frequency picture carrier frequency and signals of a predetermined frequency between said intermediate frequency picture and sound carriers;

multiplier means having first and second input channels, producing an error signal having a zero value when said input signals are in quadrature and opposite polarity maxima when said input signals are in-phase and counter-phase;

first coupling means coupling said intermediate frequency filter to the input of said surface acoustic wave filter and to said first input channel of said multiplier means;

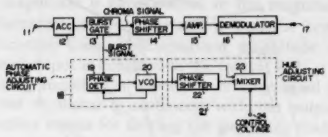
second coupling means coupling the output of said surface acoustic wave filter to said second input channel; and

third coupling means coupling said multiplier means error signal to said voltage controlled oscillator.

4,118,741
HUE ADJUSTING CIRCUITS

Hiroshi Gomi, and Shinichiro Taguchi, both of Fukaya, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 17, 1977, Ser. No. 769,784
Claims priority, application Japan, Feb. 18, 1976, 51-15838; Mar. 9, 1976, 51-24648
Int. Cl.[2] H04N *9/50, 9/535*
U.S. Cl. 358—28 **8 Claims**



1. A signal processing circuit for use in a color television receiver comprising:

demodulator circuit means connected to receive a chroma signal and a subcarrier reference signal for recovering color information from the chroma signal;

first phase shifting means connected to the input side of said demodulator circuit means for phase shifting the chroma signal to be applied to said demodulator circuit means;

subcarrier reference signal generating means responsive to a burst signal derived from a color composite signal including the chroma and burst signals for producing a subcarrier reference signal;

hue adjusting circuit means connected to the output of said subcarrier reference signal generating means and including a second phase shifting means for phase shifting the subcarrier reference signal and mixing means connected to receive and mix the phase-shifted subcarrier reference signal from said second phase shifting means and the subcarrier reference signal from said subcarrier reference signal generating means, said mixing means being arranged to vary the relative amplitude ratio between the subcarrier reference signal from said subcarrier reference signal generating means and the phase-shifted subcarrier sreference signal from said second phase shifting means in response to a control voltage; and

means for coupling the output of said mixing means to said demodulation means to recover the color information from the chroma signal;

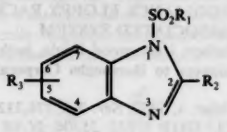
at least said first and second phase shifting means being formed on the same integrated circuit semiconductor substrate.

4,118,742
CARBONYL-SUBSTITUTED 1-SULFONYLBENZIMIDAZOLES

Charles J. Paget; James W. Chamberlin, both of Indianapolis, and James H. Wikel, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 608,415, Aug. 28, 1975, abandoned. This application Dec. 15, 1976, Ser. No. 750,991
Int. Cl.[2] C07D *235/30*
U.S. Cl. 548—306 **40 Claims**

1. A compound of the formula



(I)

wherein R_1 is C_1–C_3 alkyl, C_3–C_7 cycloalkyl, phenyl, furyl, thienyl, or R_4R_5N-, wherein R_4 and R_5 are independently C_1–C_3 alkyl or R_4 and R_5, when taken together with the nitrogen atom to which they are attached, are pyrrolidino, piperidino, or morpholino;

R_2 is amino, formamido, acetamido, propionamido or butyramido;

R_3 is C_2–C_8 alkanoyloxy, phenylacetoxy, or benzoyloxy;

wherein R_6 is hydrogen, C_1–C_7 alkyl, C_3–C_7 cycloalkyl, (C_3–C_7 cycloalkyl)methyl, 1-(C_3–C_7 cycloalkyl)ethyl, benzyl, phenyl or phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro, bromo, iodo, nitro or trifluoromethyl; or

Z=C(R_6)-, wherein Z is hydroxyimino, C_1–C_4 alkoxyimino, C_1–C_4 acyloxyimino, benzyloxyimino, benzoyloxyimino, hydrazono, thiocarbamylhydrazono, carboxymethoxyimino, methoxycarbonylhydrazono, ethoxycarbonylhydrazono, carbamylhydrazono, C_1–C_4 alkoxycarbonylethylcarbonyloxyimino, benzyloxycarbonylaminomethylcarbonyloxyimino, p-nitrobenzyloxycarbonylethylcarbonyloxyimino, or phthalimidomethylcarbonyloxyimino; and

R_3 is at the 5 or 6 position.

4,118,743

CASSETTE TAPE RECORDER WITH MEMORY CONTROLLED SELECTIVE BY-PASS

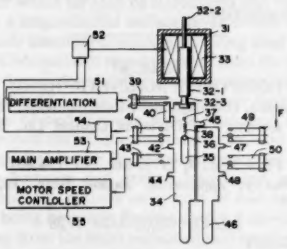
Itsuki Ban, 829, Higashioizumimachi, Nerima-ku, Tokyo; Shohei Iizuka, 363-4, Imajukunishimachi, Asahi-ku, Yokohama-shi, Kanagawa-ken, and Hisashi Funakoshi, 1-10-4, Nakamachi, Meguro-ku, Tokyo, all of Japan

Filed May 27, 1977, Ser. No. 801,257

Claims priority, application Japan, May 31, 1976, 51-62372

Int. Cl.[2] G11B *15/44, 15/18*

U.S. Cl. 360—73 **7 Claims**



1. In a magnetic recording/reproducing apparatus for cassette magnetic-tapes, which apparatus has a non-reproduction mode including a fast forward operation and a rewind operation, comprising a movable plate mounted on a deck for reciprocating movement between reproduction and non-reproduction positions, the plate being spring biased toward the reproduction position, a magnetic head mounted on the movable plate at a position where the magnetic head, when the movable plate is at the reproduction position, is in sliding contact with a magnetic tape, a pinch roller movably connected to the movable plate by a pinch roller mounting means, the pinch roller movable between a reproduction position in which the pinch roller is in contact with a capstan and a remote non-reproduction position in which the pinch roller is out of contact with the capstan, the pinch roller being spring biased to the reproduction position, tape drive means for driving the tape at a play speed with the pinch roller in its reproduction position and a fast speed with the pinch roller in the remote non-reproduction position, means supplying electric current to the tape drive means, the improvement comprising:

manually actuatable slides for selecting respectively, the fast forward and the rewind operation, said slides mounted on the deck for reciprocating movement between reproduction and non-reproduction mode positions, said slides resiliently biased toward the reproduction mode position and manually actuatable to the non-reproduction mode position;

first switch means opened and closed by each manual actuation of each of said slides to a position intermediate the slide reproduction and non-reproduction mode positions;

a magnetic actuator engaged by said slide for reciprocating movement with said slides, said magnetic actuator positioned with respect to the pinch roller to push the pinch roller away from the capstan when either one of said slides has been actuated to its non-reproduction mode position;

an electromagnetic coil surrounding said magnetic actuator for holding said magnetic actuator in its nonreproduction position by electromagnetic force when supplied with an electric current;

circuit means including a memory circuit for storing electrical signals corresponding to the number of opening and closings of said first switch means and an excitation circuit for supplying said electric current to said coil when one or more of said electrical signals are stored in said memory circuit;

detection circuit means connected to said magnetic head for detecting blank zones on the magnetic tape; and

means for erasing one of said stored signals for each detected blank zone on the magnetic tape and causing said excitation circuit to remove said holding electric current from said coil when all of said stored signals are erased from said memory circuit thereby permitting said actuator and said slide to return to the reproduction position.

4,118,744

TAPE END DETECTION RELEASE DEVICE FOR TAPE RECORDER

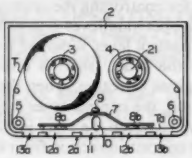
Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1977, Ser. No. 762,742

Claims priority, application Japan, Mar. 31, 1976, 51/36313; Apr. 15, 1976, 51/42735

Int. Cl.[2] G11B *15/06, 23/08, 15/10, 23/32*

U.S. Cl. 360—74 **5 Claims**



1. A tape end detection apparatus for a tape recorder having a swingably mounted member including a shaft for supporting a tape hub having a tape secured thereto and wound thereabout, said shaft causing said member to swing in a predetermined direction when the tape is substantially completely unwound from said tape hub;

normally open switch means and means responsive to move-

ment of said member in said predetermined direction for closing said switch means;

release means movable between a first position which prevents and a second position which permits said switch closing means to engage and thereby close said switch means when a tape end condition occurs;

a magnetic head means and tape drive means mounted upon a common movable member;

means for placing said movable member in an operating position wherein said magnetic head and tape drive means engage said tape; and

said movable member including means for placing said release means in said second position when said movable member is moved either into or out of said operating position.

4,118,745
SINGLE LEVER OPERATED CASSETTE TAPE RECORDER

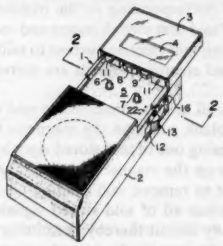
Haruo Matsuura, Shimizu, and Kiyoshi Kawahara, Shizuoka, both of Japan, assignors to Star Seimitsu Kabushiki Kaisha, Japan

Filed Apr. 15, 1977, Ser. No. 787,963

Claims priority, application Japan, Apr. 17, 1976, 51-47358[U]

Int. Cl.[2] G11B *15/02, 15/18*

U.S. Cl. 360—96 **9 Claims**



1. A cassette tape recorder comprising an enclosure including a tape cassette receiving housing, a baseplate fixedly mounted within the enclosure, a takeup shaft and a rewind shaft rotatably mounted in the baseplate and each having one end projecting into the housing, an operation lever pivotally supported on the baseplate for angular movement and carrying a knob which projects externally of the enclosure and which may be manually operated to position the operation lever to one of predetermined record, stop, playback and rewind positions, a control lever pivotally mounted on the baseplate, a drive source, a relay wheel rotatably mounted on the control lever and including a rotary shaft connected with the drive source, and means for controlling the control lever in a manner such that when the operation lever is in either record or playback position, the control lever is moved to a first operational position in which the rotary shaft is effective to drive the take-up shaft in a given direction, when the operation lever is in its rewind position, the control lever is moved to a second operational position in which the relay is effective to drive the rewind shaft in the opposite direction from the given direction, and when the operation lever is in its stop position, the control lever assumes a neutral position in which neither the rotary shaft nor the relay wheel is effective to drive the take-up and the rewind shaft, respectively, said means for controlling the control lever comprising a notch cam formed on the operation lever, a pin on the control lever engaging the notch cam, and a spring normally urging the control lever in a direction to cause the relay wheel to be operatively connected with the take-up shaft, the notch cam cooperating with the spring to control the position of the control lever through the pin.

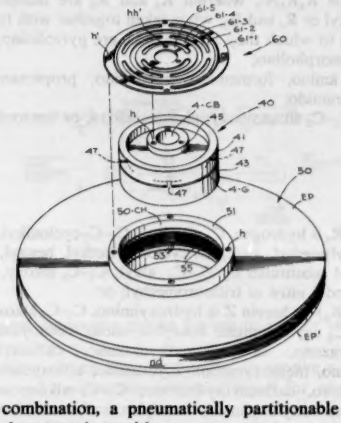
4,118,746
HIGH PERFORMANCE FLOPPY PACK AND ASSOCIATED SYSTEM

Ko Ko Gyi, and Herbert Underwood Ragle, both of Thousand Oaks, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 4, 1977, Ser. No. 774,312

Int. Cl.[2] G11B *5/012, 25/04, 21/08*

U.S. Cl. 360—99 **2 Claims**



1. In combination, a pneumatically partitionable "floppy pack" and pneumatic partition means:

said pack comprising a plurality of flexible recording disks and intermediate radially-vented, rigid separator means, both being arranged to form a co-rotatable stack with a center-bore of prescribed length and diameter;

the separator means serving to separate the disks from one another a prescribed uniform distance;

the pack so-formed being adapted for disk separation and partition by said partition means disposed in the center-bore, each partition means being arranged and adapted to direct at least one pressurized jet stream between selected disk surfaces, through the associated separator means therebetween, so as to deflect flanking disks and thus partition the stack;

said partition means also being flexibly coupled to said pack for precisely-aligned, adjustably-centered reciprocation up and down said bore whereby to precisely control the partition-selection.

4,118,747
COMPOSITE MAGNETIC HEAD

Naohiro Hanaoka, Hachioji, and Misao Shimoda, Hamura, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1977, Ser. No. 774,402

Claims priority, application Japan, Mar. 10, 1976, 51-29084[U]

Int. Cl.[2] G11B *5/20, 5/28*

U.S. Cl. 360—121 **4 Claims**

1. A composite magnetic head including a record/playback gap and an erase gap, comprising:

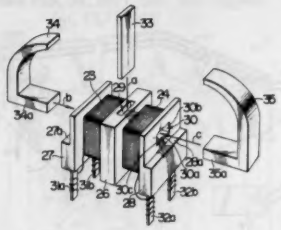
a straight, central core;

a pair of lateral cores disposed in mutually opposite relationship with a front end and a rear end of the central core so as to hold the ends of the central core therebetween, each of the lateral cores having a rear portion which extends in a direction perpendicular to the length of the central core to provide a bobbin carrying portion;

a bobbin having a central flange and a pair of end flanges, the central flange being formed with an opening for receiving the central core and the bobbin being formed with a slot

extending through the length thereof including both end flanges in a direction perpendicular to the opening;

a pair of coils respectively disposed between the central flange and each of the end flanges;



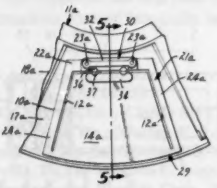
the central core being disposed in the opening and the bobbin carrying portions of the lateral cores being disposed in the slot in such a manner that a record/playback gap and an erase gap are defined between the opposite sides of the front end of the central core and each front end of the both lateral cores.

4,118,748

MEMBER FOR LIMITING AIR DOOR MOVEMENT IN A DISK CARTRIDGE

Arlin B. Doering, South St. Paul, and Kenneth H. Volness, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 21, 1976, Ser. No. 707,712
Int. Cl.[2] G11B *5/82, 17/26, 23/04*
U.S. Cl. 360—133 **4 Claims**



1. In a disk cartridge comprising a housing having an air inlet port through which air may be introduced into the housing; a disk having a magnetizable surface layer within the housing; and an air door assembly comprising a spring steel plate having a generally U-shaped slot closely spaced from the periphery of the plate on three sides to define portions of the plate including an air door shaped to extend across said air inlet port on the inner surface of said housing and a U-shaped biasing strip extending around the air door on three sides, said biasing strip including a central length fixedly attached to said housing and side lengths between said central length and said air door extending generally radially outwardly of said cartridge, said side lengths being sinuously flexible to afford movement of said air door away from the inner surface of said housing to an open position in an attitude which may or may not be parallel thereto and providing means for biasing the air door to its closed position, and means for limiting movement of the edge portion of the door adjacent the central length of said biasing strip at a full open position; said disk cartridge being removably mountable on a disk drive unit adapted to engage and rotate the disk within the housing, which drive unit may include means for opening the air door and for injecting air into the disk cartridge upon mounting of the disk cartridge on the disk drive; the improvement wherein said means for limiting movement comprises a unitary polymeric member comprising:

a first anchor portion attached to the central length of said biasing strip;

a second anchor portion attached to said edge portion of said air door;

first and second rigid link portions of about equal length; and

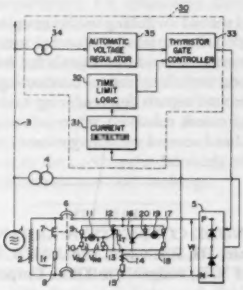
first, second and third thin flexible hinge portions, said first flexible hinge portion attaching one end of said first link portion to said first anchor member, said third flexible hinge portion attaching one end of said second link portion to said second anchor portion, and said second flexible hinge portion attaching together the ends of said links opposite said anchor members.

4,118,749

FIELD OVERVOLTAGE PROTECTING APPARATUS FOR SYNCHRONOUS MACHINE

Takeshi Matuzaki; Masuo Goto, both of Hitachi, and Yasushi Momochi, Hitachiota, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 30, 1977, Ser. No. 782,745
Claims priority, application Japan, Apr. 2, 1976, 51-35969
Int. Cl.[2] H02H *7/09*
U.S. Cl. 361—33 **22 Claims**



1. A field overvoltage-protecting apparatus for a synchronous machine having an armature and a field winding, said apparatus comprising field excitation control means impressed with an armature voltage of said synchronous machine to form a DC power supply, a DC output of which is applied to the field winding of said synchronous machine to excite it, first discharge means for discharging energy stored in said field winding under a predetermined condition, and second discharge means for reducing the field voltage by allowing field current to pass therethrough in response to generation of an overvoltage across said field winding whose absolute value is higher than a predetermined value across said field winding, said second discharge means having a resistance larger than said first discharge means.

4,118,750

VITAL RELAY OPERATING CIRCUIT

John H. Auer, Jr., Fairport, and Henry C. Sibley, Adams Basin, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

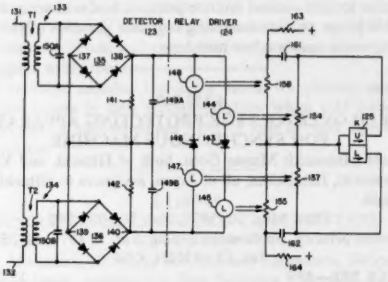
Continuation of Ser. No. 606,695, Aug. 21, 1975, abandoned.
This application Jan. 14, 1977, Ser. No. 759,304
Int. Cl.[2] H01H *47/22*
U.S. Cl. 361—182 **18 Claims**

9. A circuit for actuating a vital relay in response to an a.c. signal being alternately modulated to signals of first and second frequencies and comprising in combination:

(a) first and second rectification means responsive to said first and second frequencies for producing first and second d.c. output potentials, respectively;

(b) said first and second d.c. output potentials coupled in series opposition across a terminal pair for producing an output potential having the polarity of the dominant one of said first and second d.c. output potentials;

(c) first and second polarity responsive control means bridged in parallel across said terminal pair for producing first and second signals and second and first signals, respectively, when the potential across said terminal pair is of the polarity of said first and second d.c. output potentials, respectively;



(d) first and second switching means coupled to said first and second polarity responsive control means, respectively, and responsive to said first signals for rendering said first and second switching means conducting; and responsive to said second signals for rendering said first and second switching means relatively nonconducting; and wherein

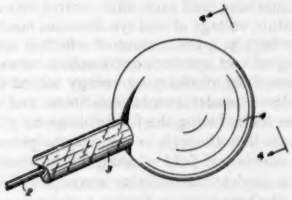
(e) said first and second switching means control the flow of current to the vital relay.

4,118,751

CORONODE CONNECTION ARRANGEMENT

Fred F. Hubble, III, Rochester, and John B. Tasseff, II, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 31, 1977, Ser. No. 802,163
Int. Cl.[2] H05F *3/00*; H01T *19/00*
U.S. Cl. 361—220 **5 Claims**



1. A corona discharge device comprising a coronode, said coronode including an inner wire coated with a frangible dielectric and a conductive member carried on at least one end of said coronode, said member fracturing said dielectric material to contact said inner wire.

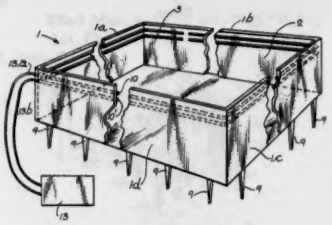
4,118,752

APPARATUS FOR INFLICTING ELECTRIC INJURY UPON LAND SHELLFISH SUCH AS SNAILS AND THE LIKE

Shozo Iguchi, 1-6, Roppongi 5-chome, Minato-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 654,177, Feb. 2, 1976, abandoned. This application Apr. 29, 1977, Ser. No. 792,268
Int. Cl.[2] H05C *1/04*
U.S. Cl. 361—232 **4 Claims**

1. An apparatus for collecting shellfish, comprising: a shellfish collection enclosure to enclose a collection area, said enclosure comprising insulating wall means of a height to be scaled by the shellfish, said wall means having exposed on only the inner surface thereof a pair of exposed vertically spaced conductors spaced less than the length of the shellfish and horizontally extending over the length of the wall means so as to be in the advancing path of the shellfish scaling the wall means from inside the enclosure, and means for applying inter-



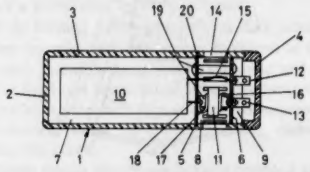
mittent voltage pulses of a value which are not hazardous to humans continuously to said conductors which pulses are spaced apart a time interval less than the time required for the shellfish to traverse the space therebetween.

4,118,753

STARTING DEVICE FOR AN ASYNCHRONOUS MOTOR

Holger Vilhelm Vind, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed May 18, 1977, Ser. No. 798,175
Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623119
Int. Cl.[2] H05K *7/20*
U.S. Cl. 361—331 **1 Claim**



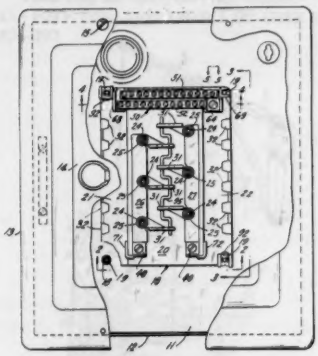
1. A starting device for an asynchronous motor, comprising, first and second disk shaped wall elements, means connecting said wall elements and maintaining them in spaced apart parallel relation, first and second plug connectors attached to the outer side of said first wall element, first and second U-shaped springs attached respectively to the inner sides of said first and second wall elements in axial alignment with said first plug connector, means extending through said first wall element electrically connecting said first plug connector and said first spring, a disk shaped PTC resistor disposed between and held in place by said springs, an electrolytic capacitor having leads at one end thereof attached to the outer side of said second wall element, one of said capacitor leads extending through said second wall element into electrical contact with said second U-shaped spring, the other of said capacitor leads extending through both of said wall elements into electrical contact with said second plug connector, said above elements constituting a unified chassis, a cylindrically shaped housing for said chassis having open and closed ends, an annular groove in said housing adjacent to and in spaced relation to said open end thereof, said chassis being mountable insaid housing with said capacitor adjacent said closed end thereof and said second wall element being snapped into said groove, and ventilation openings in said housing between said first and second chassis walls.

4,118,754

ELECTRICAL PANEL HAVING MOLDED BASE PAN

J. E. Duggan, Atlanta, Ga., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 28, 1977, Ser. No. 772,442
Int. Cl.[2] H02B 1/20
U.S. Cl. 361—355 10 Claims



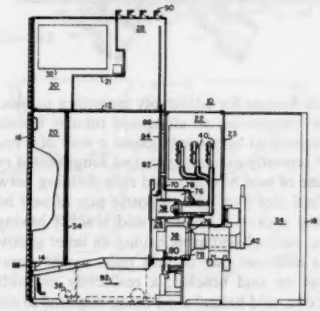
1. An electrical panel assembly including a single member defining an insulating base; first and second main buses supported on said base in front thereof on a first set of formations formed integrally with said base; circuit breaker engageable stab means extending from said buses and disposed in general alignment between said buses and in front of said base; a second set of formations formed integrally with said base for mechanically holding circuit breakers in engagement with said stab means; a neutral bus supported on said base in front thereof on a third set of formations formed integrally with said base.

4,118,755

SELF-COOLED METAL-CLAD SWITCHGEAR

Norman Davies, Trafford, Pa.; Morley P. Langley, Boksburg, Transvaal, South Africa, and Howard C. Peppel, deceased, late of Murrysville, Pa. (by Virginia L. Peppel, administrator), assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 675,013, Apr. 8, 1976. This application Oct. 5, 1977, Ser. No. 839,531
Int. Cl.[2] H02B 1/18
U.S. Cl. 361—379 8 Claims



1. A self-cooled switchgear structure comprising, in combination:

a housing having a plurality of compartments therein including a contact and current transformer compartment and an exhaust compartment;

a circuit breaker removably disposed in one of said compartments;

a plurality of primary disconnecting contacts for said circuit breaker disposed in said contact and current transformer compartment;

an individual bushing surrounding each disconnecting contact;

a current transformer surrounding each disconnecting contact and the bushing associated therewith;

apertured support means for supporting said current transformers, said support means surrounding said current transformers and forming said contact and current transformer compartment;

entrance means disposed in said housing, vertically lower than said support means, for inserting a cooling fluid into said housing, said entrance means being in fluid communication with said current transformer through said apertured support means, said cooling fluid flowing adjacent said current transformers and said bushings to provide cooling thereof;

exhaust means disposed in said housing, vertically higher than said current transformers and extending into said exhaust compartment, for exhausting fluid from within said exhaust compartment; and

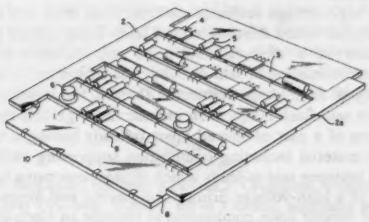
duct means disposed within said housing for transferring cooling fluid from said contact and current transformer compartment to said exhaust compartment, said duct means terminating, at one end thereof, within said exhaust compartment, and, at the other end thereof, in said contact and current transformer compartment and in fluid communication with the cooling fluid flowing adjacent to said current transformers and said bushings.

4,118,756

HEAT PIPE THERMAL MOUNTING PLATE FOR COOLING ELECTRONIC CIRCUIT CARDS

Lloyd A. Nelson, Villa Parks, and Kalwant S. Sekhon, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 559,353, Mar. 17, 1975, abandoned. This application Apr. 14, 1977, Ser. No. 787,246
Int. Cl.[2] H01L 23/46
U.S. Cl. 361—385 10 Claims



6. An electronic module with an integral heat pipe thermal mounting plate comprising in combination:

means for defining at least one electronic circuit card;

means for defining heat dissipating electronic components electrically coupled to said circuit card means;

means for defining an electric connector coupled to said circuit card means in electrical connection with said electronic components means;

first heat pipe means with condenser wicking configured as a thermal joint area for connection to an external heat sink; and

second heat pipe means with evaporator wicking configured as at least one conduction bar which extends from said thermal joint area and which is provided with means for mounting said heat dissipating electronic components means in heat transfer connection therewith.

4,118,757

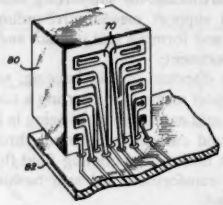
PIN EXTENDER STRIP FOR VERTICALLY MOUNTING MULTI-PIN ELECTRONIC DEVICES

Kenneth D. Rinaldo, Santa Clara, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Division of Ser. No. 627,443, Oct. 30, 1975, abandoned. This application May 4, 1977, Ser. No. 793,705

Int. Cl.[2] H05K *1/04*

U.S. Cl. 361—404 **3 Claims**



1. In combination, an electronic display device having contact pins accessible on one side thereof, a printed circuit board having conductive leads formed thereon, and a plurality of elongated pin extender elements connected between individual ones of said contact pins and points of contact on associated ones of said conductive leads, each of said extender elements having pin receiving means for receiving said pins and being oriented at an off-orthogonal angle with respect to said printed circuit board, so that said display device is mounted orthogonal to said printed circuit board with said extender elements extending at an angle from said display device to said printed circuit board and forming a triangulated structural support for said display device.

4,118,758

PHOTOFLASH LAMP ARRAY HAVING HIGH VOLTAGE SHORTING TYPE FLASH LAMPS AND RADIATION SENSITIVE SWITCHING ELEMENTS

Dominic A. Cusano, Schenectady, and Harold F. Webster, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,449

Int. Cl.[2] G03B *15/02*

U.S. Cl. 362—6 **9 Claims**

1. A high-voltage activated multiple flash lamp array utilizing a circuit board member with a lamp firing circuit pattern deposited on a dielectric substrate and radiation-sensitive switches connected in said circuitry for sequential firing of a plurality of flash lamps connected thereto, the improvements wherein said flash lamps each include flash ignition means in the form of a pair of spaced apart in-leads having a mass of primer material including combustion supporting oxide connected between said in-leads which ignites responsive to application of a high-voltage firing pulse thereto and forms a conductive residue upon combustion to provide an electrical path interconnecting said in-leads and with said flash lamps activating radiation-sensitive switches located adjacent thereto which are connected in said circuit pattern to physically interrupt the circuit path to the activating flash lamp by thermal decomposition.

4,118,759

BOOK SUPPORT

Jean Hauville, Le Crot du Lac, Montillot, France (89660)

Filed Jan. 24, 1977, Ser. No. 761,770

Claims priority, application France, Feb. 9, 1976, 76 03471; Jan. 7, 1977, 77 00313

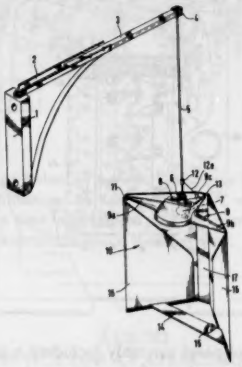
Int. Cl.[2] F21V *33/00*; A47B *97/04*

U.S. Cl. 362—98 **9 Claims**

1. A book support for maintaining a book in a suspended position for reading, comprising:

a book holder having front and rear portions, and adapted to support an open book therein;

a lamp shade for carrying said book holder, and including a central element having three arms extending therefrom, two of said arms extending along a common, substantially horizontal axis, and the third of said arms being substantially orthogonal to said horizontal axis, said front portions of said book holder being mountable on the free ends



of said first two arms, and the rear portion of said book holder being mountable on the free end of said third arm;

a suspension member, said lamp shade being mounted on said suspension member;

means for adjusting said third arm in a substantially vertical plane, so as to pivot said lamp shade and the book holder mounted thereon about said horizontal axis; and

a light source located in said central element of said lamp shade.

4,118,760

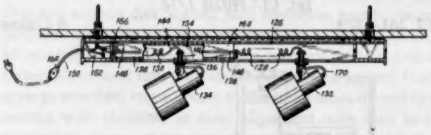
ADJUSTABLE HANGER FOR ELECTRIC LIGHTS

Bertram J. Cohon, 317 Summit Ave., Hackensack, N.J. 07601

Filed Jan. 7, 1977, Ser. No. 757,686

Int. Cl.[2] F21V *21/00*; F21S *1/12, 3/10*

U.S. Cl. 362—239 **47 Claims**



1. A track hanger for adjustably mounting an electric lamp, said hanger comprising an elongated tubular housing having one side adapted to be placed against a wall of a room, a pair of opposed laterally extending spaced longitudinal rails on the opposite side of said housing, said rails defining between them a longitudinal slot over said opposite side of said housing, an electric lamp socket, a bracket, said bracket having two opposed arms, each of said arms having an inner groove slidably engaging a different one of said rails, means mounting said lamp socket on said bracket, a resiliently extensible helical electrical cord, said helical cord being disposed in said housing with the central axis of the helix extending longitudinally of the housing, said helical cord in relaxed position having a diameter greater than the width of said slot, a cord guide tube, said cord guide tube extending from said bracket through said slot, one end of said cord passing through said cord guide tube and being physically and electrically connected to said lamp socket by means of said cord guide tube, means to supply

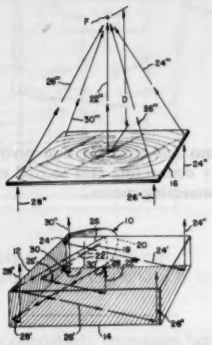
electricity to the other end of said cord so that an electric lamp when in said lamp socket may be lit, and means to attach said one side of said housing to a surface.

4,118,761

LIGHT CONDENSING ILLUMINATOR

Thomas W. Dey, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,887
Int. Cl.[2] F21V *7/00, 5/00;* **G02B** *5/08;* **G03B** *21/08*
U.S. Cl. 362—297 **12 Claims**



1. An illumination device for condensing light along a given axis toward a defined illumination area, comprising:

a light source for transmitting substantially collimated light;

first reflector means defining a first mirrored planar grating having a grooved area for directly receiving the collimated light transmitted from the light source and disposed to reflect the substantially collimated light to uniformly distribute the light over an area substantially larger than the area of the first mirrored grating;

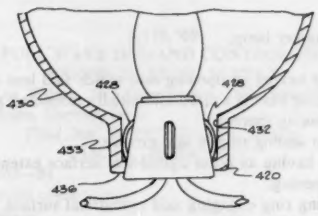
second reflector means defining a second mirrored grating having reflective grooves of differing pitch for optical power disposed parallel to the plane of the first grating to define an area larger than the area of the first mirrored grating to receive the light reflected by the first reflector means to direct the light by reflection in a condensing pattern about the given axis toward the defined illumination area.

4,118,762

ORNAMENTAL LIGHT ARRANGEMENT

John C. Fennell, Rte. 4, Harmon Dr., Swainsboro, Ga. 30401

Filed Apr. 5, 1976, Ser. No. 673,648
Int. Cl.[2] F21V *3/00, 5/00*
U.S. Cl. 362—311 **5 Claims**



1. An ornamental light arrangement comprising:

(a) a light receiving element, said element having a base, said base receiving a light socket in one end thereof to hold a light bulb therein, said base also having an electrical conductor, said conductor being electrically connected to said socket, said base having a forward surface taper in the direction of said light socket and having at least one spring member secured thereto along said forward tapered surface; and

(b) a globe receivable over a light bulb located in said socket, said globe having an opening therein with an inwardly protruding lip therearound that is receivable over at least a portion of said forward tapered surfaces and deforms said at least one spring member during placement thereover with said spring member returning to its original configuration inside said globe to secure said globe to said base.

4,118,763

VARIABLE TRANSMISSION PRISMATIC REFRACTORS

Mitchell M. Osteen, Zirconia, N.C., assignor to General Electric Company, N.Y.

Filed Apr. 12, 1976, Ser. No. 675,839
Int. Cl.[2] F21V *5/02*
U.S. Cl. 362—339 **1 Claim**

1. A luminaire comprising, in combination, a bowl-shaped globe of light transmitting material having an open top and inner and outer surfaces, a light source arranged within said globe so that light rays therefrom are incident on the inner surface of said globe, the outer surface of said globe being formed with a plurality of elongated prisms extending between the top and bottom of said globe, each said prism having a reflecting portion for reflecting a predetermined amount of said incident light back through said inner surface and having a transmitting portion for transmitting the remainder of said incident light outwardly from said globe, at least certain of said elongated prisms having reflecting portions and transmitting portions of different relative areas along the prism length.

4,118,764

LAMP ASSEMBLY

Arthur F. Bleiweiss, Toronto; Kenneth J. Crompton, Willowdale, and Karel Urbanek, Weston, all of Canada, assignors to Dominion Auto Accessories Limited, Toronto, Canada

Filed Dec. 15, 1976, Ser. No. 750,605
Int. Cl.[2] B60Q *1/32;* **F21V** *17/00, 15/04*
U.S. Cl. 362—369 **21 Claims**

1. In a lamp assembly, the combination comprising

a housing assembly including a bottom wall,

a mounting member,

means for fastening said mounting member on said bottom wall,

said mounting member having a central resilient portion spaced from said base,

said central portion having a centrally located opening therein,

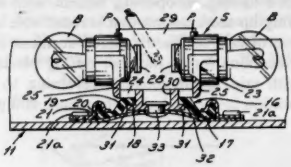
a socket base,

said base having a centrally located projection,

said projection extending through said opening,

a ground strap of electrically conductive material,

means for fastening said ground strap to said projection of said socket base,



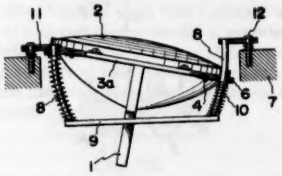
said strap having portions thereof extending beneath said resilient mounting member and contacting the upper surface of said bottom wall of said housing.

4,118,765

AUTOMOBILE HEADLIGHTS

Toru Atsuchi, 3-15-1, Morisaki, Yokosuka-City Kanagawa-Ken, Japan

Filed Feb. 4, 1977, Ser. No. 765,802
Claims priority, application Japan, Feb. 23, 1976, 51-18620
Int. Cl.[2] B60Q *1/12*
U.S. Cl. 362—384 **13 Claims**



1. A headlight arrangement comprising a rear support; a front support spaced from the rear support; two spaced rails each extending between and being fixed to the supports; a headlight; slidable mounting means for slidably mounting the headlight on each of the rails; and two springs each surrounding a respective one of the rails and each having one end pressing against the rear support and another end pressing against the mounting means to thereby bias the mounting means to a position against the front support, whereby the headlight responds to centrifugal force by sliding on one of the rails and in the direction of the rear support to thereby compress the respective spring which subsequently presses the mounting means back to the position against the front support when the centrifugal force diminishes while the headlight remains substantially stationary on the other rail with the front support preventing a corresponding expansion of the other spring and thereby at least substantially preventing an aftereffect of swinging when centrifugal force is diminished.

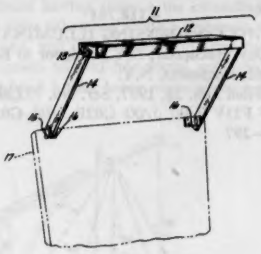
4,118,766

FLUORESCENT LIGHT FIXTURE

Theodore A. Kredo, Torrance, Calif., assignor to California Precision, Torrance, Calif.

Filed Jul. 15, 1976, Ser. No. 705,754
Int. Cl.[2] A47F *5/00*; H05B *33/02*
U.S. Cl. 362—427 **10 Claims**

1. An improved fluorescent lamp fixture having a hood assembly comprised of at least one fluorescent light element and a means for holding said element in a space relationship to a reflective means formed on the inner surface of said assembly where said assembly is connected to at least two spaced means each having a first and second end for maintaining said assembly in a spaced relationship with respect to a surface and a connecting means for connecting said spaced means to said surface, the improvement comprising the disposition of a ballast within said hood assembly, a pretensioned pivot joint system rotatably connecting said hood assembly to first end of



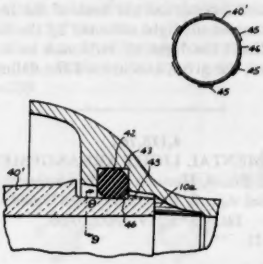
said spaced means and multiple disc pivot joint tensioning systems rotatably connecting said second end of said spaced means to said connecting means.

4,118,767

MARKER LAMP LENS AND MOUNTING THEREFOR

Karel Urbanek, Weston, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Calif.X

Filed Sep. 20, 1976, Ser. No. 724,522
Int. Cl.[2] F21V *17/00*
U.S. Cl. 362—455 **4 Claims**



1. In a marker lamp,

a lens,

a housing having an opening into which said lens extends,

said housing having a circumferentially extending groove in the opening thereof,

a resilient sealing ring in said groove,

said lens having an outer cylindrical surface extending into said opening,

said sealing ring engaging said cylindrical surface,

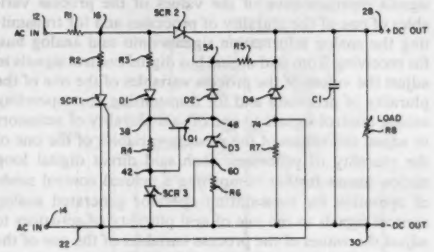
said cylindrical surface having a length in the direction of the axis thereof which is greater than the width of said groove,

said cylindrical surface having circumferentially spaced radially extending projections thereon on a portion of said lens extending axially within the opening of said housing beyond said groove.

4,118,768
DEMAND CONTROLLED PREREGULATING RECTIFIER CIRCUIT FOR POWER SUPPLIES

Denney L. Wilson, Sr., Georgetown, Del., assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 21, 1977, Ser. No. 779,654
Int. Cl.[2] H02M 7/155
U.S. Cl. 363—85 16 Claims



1. A power supply circuit comprising:

input means for connection to a source of alternating potential;

output means;

rectifying means operatively connected between said input and output means, and having gating means associated therewith;

utilization means operatively connected to said output means;

first control means having an input operatively connected to said input means and having an output operatively connected to said gating means for controlling said rectifying means to allow said rectifying means to supply a rectified voltage to said output means;

second control means operatively connected to said first control means and including voltage detecting means responsive to said output of said first control means to enable said second control means to disable both said first control means and said voltage detecting means whenever a predetermined voltage level is reached at said output of said first control means whereby the power dissipation in said first control means and said voltage detecting means is minimized.

4,118,769
FULL WAVE DEMAND CONTROLLED PREREGULATING SUPPLY

Denney Lee Wilson, Sr., Georgetown, Del., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 20, 1977, Ser. No. 808,213
Int. Cl.[2] H02M 7/155
U.S. Cl. 363—54 11 Claims

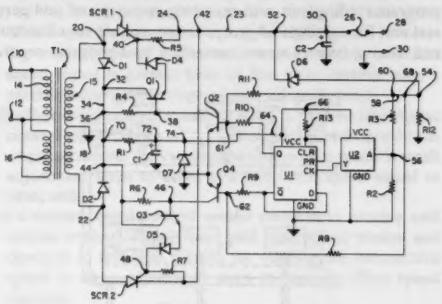
1. A circuit comprising:

input means;

output means including a storage capacitor;

first and second rectifier means operatively coupled between said input means and said output means for supplying a rectified voltage to said output means; and

control means operatively coupled between said output means and said first and second rectifier means for insuring that said first and second rectifier means will alternately supply said rectified voltage to said storage capacitor when a load connected to said output means draws

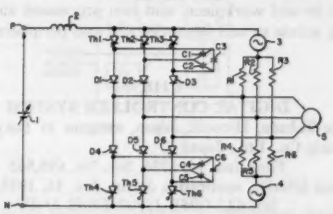


current at a charging frequency of one of said first and second rectifier means.

4,118,770
INVERTER APPARATUS COMMUTATED BY AN AUXILIARY SOURCE

Sachirou Sugimoto, and Kanji Katsuki, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1977, Ser. No. 773,458
Claims priority, application Japan, Mar. 24, 1976, 51-32267
Int. Cl.[2] H02M 7/515
U.S. Cl. 363—138 1 Claim



1. In a series diodes bridge type power inverter, the combination of: a direct current source for supplying energy to the inverter; series networks in each branch of said bridge including a main thyristor and a main diode, commutation capacitors each inserted between phases and connected to the junction point between a main thyristor and a main diode of a corresponding network, a commutation auxiliary source connected in circuit with the inverter through an impedance including a resistor and mounted between each phase line on the AC side of the inverter and the positive terminal of said direct current source, and between each phase line on the AC side and the negative terminal of the direct current source.

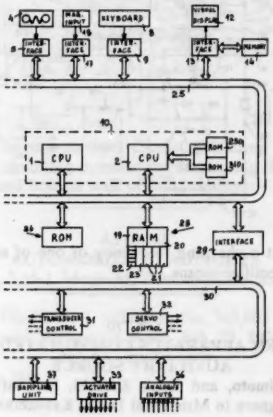
4,118,771
NUMERICAL CONTROL SYSTEM FOR MACHINE TOOLS

Piero Pomella, and Luciano Lauro, both of Ivrea (Turin), Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Torin), Italy

Filed Mar. 28, 1977, Ser. No. 782,172
Claims priority, application Italy, Mar. 29, 1976, 67725 A/76
Int. Cl.[2] G06F 15/46, 15/16
U.S. Cl. 364—101 13 Claims

1. In a machining centre or similar working machines, a numerical control system for controlling the relative movement of a tool and a workpiece to be machined in accordance with a predetermined machining program, comprising a program reading unit, an operating memory, at least one periph-

eral unit for measuring or controlling the movement of said tool and said workpiece, at least a pair of processors, a common signal bus means interconnecting said processors, said program reading unit, said operating memory and said peripheral unit for causing said processors to operate simultaneously, and sharing control means controlled by a program recorded



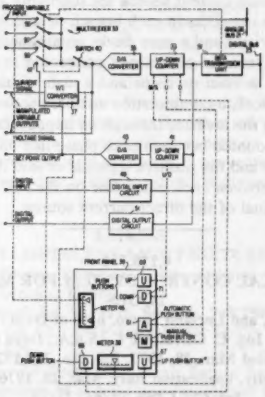
in a program memory common to said two processors for causing a first one of said processors to control said peripheral unit and the second of said processors to execute the computations relating to the interpolation of the path of said tool with respect to said workpiece, said two processors automatically sharing access to said memories and said peripheral unit.

4,118,772

DIGITAL CONTROLLER SYSTEM

Keisuke Takada, Hinoshi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Jun. 14, 1976, Ser. No. 695,563
Claims priority, application Japan, Jun. 16, 1975, 50-72025
Int. Cl.[2] G05B *13/00*; G06B *15/00*
U.S. Cl. 364—119 **4 Claims**



1. A digital controller system for controlling the process variables of a plurality of processes comprising:

a plurality of detectors, each detector for detecting the values of the process variables of a corresponding one of the plurality of processes;

a plurality of actuators, each actuator for adjusting the values of the process variables of a corresponding one of the plurality of processes;

a digital bus for transmitting digital signals from one location to another;

an analog bus for transmitting analog signals from one location to another;

a plurality of direct digital loop station means, each of said direct digital loop station means for respectively receiving from one of said plurality of detectors analog information signals representative of the values of the process variables of one of the plurality of processes and for transmitting the analog information signals onto said analog bus, for receiving from said digital bus digital control signals to adjust the values of the process variables of the one of the plurality of processes and for transmitting corresponding analog control signals to one of said plurality of actuators to adjust the values of the process variables of the one of the plurality of processes, each said direct digital loop station means further comprising a manual control mode of operation for transmitting operator generated analog control signals to the one of said plurality of actuators to adjust the values of the process variables of the one of the plurality of processes, and including means for setting set point variables for comparison with the values of the process variables when each said direct digital loop station means is operated in the manual control mode of operation; and

first central processor means for transmitting the digital control signals to said digital bus and for receiving the analog information signals from said analog bus, said first central processor means having an input and an output and including a first digital computer having an input and an output, a first analog-to-digital converter connected between the input of said first central processor means and the input of said digital computer, and a first data transmission means connected between the output of said digital computer and the output of said first central processor means,

whereby the function of the first central processor means is backed up by each of said direct digital loop station means by operating said direct digital loop station means in the manual control mode in the event said first central processor means fails.

4,118,773

MICROPROGRAM MEMORY BANK ADDRESSING SYSTEM

Michel M. Raguin, Medford, and Thomas F. Joyce, Burlington, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 1, 1977, Ser. No. 783,532
Int. Cl.[2] G06F *9/12, 13/00*
U.S. Cl. 364—200 **7 Claims**

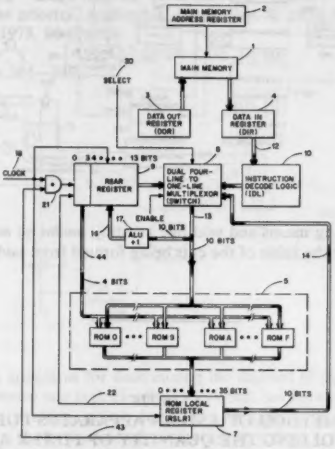
1. In a data processing system having a plurality of registers for storing electronic signals and a read only memory (ROM) system, said ROM system having at least one read only memory (ROM) having a plurality of banks of memory, each bank for storing a plurality of microprograms, each microprogram comprised of a plurality of microwords, each microword comprised of a plurality of bits, any of said microwords, stored in said ROM, being addressed by a predetermined number of bits stored in a ROM address register (RSAR) coupled to said ROM, said RSAR being one of said plurality of registers, said ROM system further comprised of a ROM local register (RSLR) also coupled to said ROM for storing any of said microwords read from said ROM during a current cycle, any of said microwords addressed by said predetermined number of bits stored in said RSAR during a previous cycle, an apparatus for increasing the capacity and speed of access of said ROM system comprising:

(a) first means, in said ROM system, for storing first coded signals for addressing any one of said plurality of registers;

(b) second means, in said first means, for storing second

coded signals of a predetermined first constant indicating a predetermined one of said plurality of registers, said predetermined one of said plurality of registers being said RSAR;

(c) third means, in said first means, for storing third coded signals of a predetermined second constant indicating a predetermined one of said plurality of banks; and



(d) fourth means, coupled to said RSLR and to said RSAR and to said third means for transferring said third coded signals to said RSAR during said current cycle, whereby said predetermined one of said plurality of banks can be selected for reading in a next cycle by executing a predetermined one of said microwords during said current cycle.

4,118,774

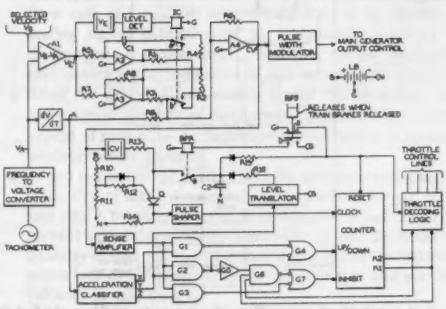
LOCOMOTIVE SPEED CONTROL APPARATUS

Raymond C. Franke, Shaler Township, Allegheny County, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 16, 1977, Ser. No. 797,088

Int. Cl.[2] B60L *3/08*; G05D *13/62*

U.S. Cl. 364—431 **12 Claims**



1. In a locomotive speed control system, the combination comprising,

(a) a signal processing means operable for processing an input signal into a control signal at an output terminal and having a first operating condition for transferring an input signal without change to form an output control signal and a second operating condition for producing a non-proportional output control signal in response to a variable input signal,

(b) a speed signal source coupled for supplying said speed signal, representing the difference between a selected locomotive speed and the actual locomotive speed, as an input signal to said processing means,

(c) a level detection means responsive to the absolute value of said speed signal and coupled for shifting said processing means between its first and second conditions as said speed signal is greater than or less than, respectively, a predetermined percentage of said selected speed,

(d) a first speed control means coupled to receive said output control signal from said processing means and operable in response thereto for varying the locomotive speed in small adjustment steps to drive said difference speed signal to zero, and

(e) a second speed control means coupled to receive said output control signal from said processing means and operable in response thereto for varying the locomotive speed in large adjustment steps to quickly effect speed changes.

4,118,775

TAXIMETER FARE COMPUTING DEVICES

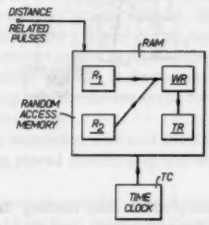
Peter Howard Boyce, Swindon, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Mar. 18, 1977, Ser. No. 778,972

Claims priority, application United Kingdom, Mar. 18, 1976, 10859/76

Int. Cl.[2] G07B *13/00*

U.S. Cl. 364—467 **7 Claims**



1. In a charge indicating system, a computing device for computing a fare to be charged comprising first register means for accommodating and storing information relating to distance related pulses received by said system, second register means for storing information relating to the number of distance related pulses that correspond to a predetermined threshold speed that would be received in a predetermined time period, third register means for storing information relating to an accumulating total, and working register means operable in conjunction with said first and second register means for comparing the information in said first and second register means and for adding the information of one or the other thereof to the information of the third register means dependent upon their relative values.

4,118,776

NUMERICALLY CONTROLLED MACHINE COMPRISING A MICROPROGRAMMABLE COMPUTER OPERABLE WITH MICROPROGRAMS FOR MACROINSTRUCTIONS AND FOR INHERENT FUNCTIONS OF THE MACHINE

Masayoshi Isomura, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 706,044, Jul. 16, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,684

Claims priority, application Japan, Jul. 17, 1975, 50/87711

Int. Cl.[2] G05B *19/18*; G06F *9/16*

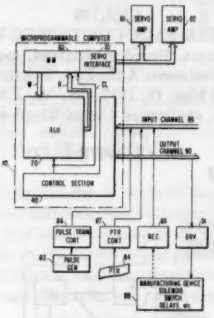
U.S. Cl. 364—474 **7 Claims**

1. A numerically controlled machine to be put into operation

by command data stored in a command store, said machine comprising a machine section, reading means for reading said command store to derive command signals representative of said command data, and a numerical control device responsive to said command data for putting said machine section into operation, said numerical control device comprising a microprogrammable computer which comprises:

memory means comprising, in turn, first memory means for storing therein said command data, second memory means for storing therein first results of calculation, and third memory means for storing therein a macroprogram composed of a sequence of macroinstructions;

a control memory for storing a first microprogram composed of a sequence of first microinstructions and a second microprogram composed of a sequence of a second microinstructions;



control means coupled to said reading means, said first through third memory means, and said control memory for storing in response to said command signals said command data in said first memory means, for executing at a first rate said macroinstructions in response to said first microinstructions to successively derive said first results of calculation from the command data stored in said first memory means and to store the successively calculaed first results of calculation in said second memory means, and for executing at a second rate faster than said first rate said second microinstructions to derive second results of calculation from the successively calculated and stored first results of calculation; and

operation means responsive to said second results of calculation for putting said machine section into operation.

4,118,777

COMPUTER DIRECTED PRIMAL CUT INDICATING DEVICE

Charles H. Wallace, Carrollton, Va., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 16, 1976, Ser. No. 714,875

Int. Cl.[2] A22C *17/00;* **G01G** *19/40;* **G06F** *15/46*

U.S. Cl. 364—475 **9 Claims**

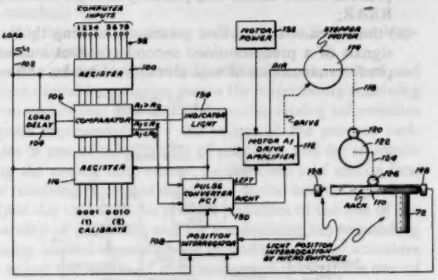
1. Cut position reference indicating means for directing the cutting of primal cuts from carcasses, comprising:

cutting means;

line creating means;

means for positioning said line creating means relative to said cutting means; and

computer directed control means for operating said positioning means to indicate the relative spacing between said



cutting means and said line creating means so as to optimize the value of the cuts being formed from said carcass.

4,118,778

METHOD OF AND AN APPARATUS FOR CONTROLLING THE QUANTITY OF FILTER AID FED TO A SEDIMENTATION FILTER IN A GIVEN UNIT OF TIME DURING FILTRATION

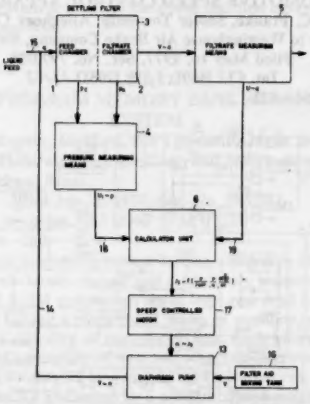
Fritz Strub, St. Gallen, Switzerland, assignor to Filtrox Maschinenbau A.G., St. Gallen, Switzerland

Filed Jul. 13, 1977, Ser. No. 815,285

Claims priority, application Switzerland, Jul. 16, 1976, 9134/76

Int. Cl.[2] G06G *7/58;* **B01D** *37/02*

U.S. Cl. 364—502 **49 Claims**



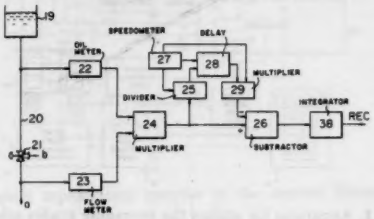
1. A method of controlling the quantity of filter aid fed to a settling filter during filtration per unit of time by admixture with the unfiltered feed comprising forming a first magnitude which is a linear function of the pressure drop across the settling filter, forming a second magnitude which is dependent on the quantity of liquid flowing through the settling filter per unit of time, and adjusting the quantity of filter aid fed to the unfiltered feed per unit of time in proportion to a third magnitude which is dependent on the ratio of said first magnitude to said second magnitude and/or on variations in this ratio with respect to time.

4,118,779

APPARATUS AND PROCESS FOR DETERMINATION OF OIL CONTENT IN DEBALLASTING WATER AND WASH WATER DISCHARGED FROM A TANKER

Fumio Tanei, Takatsuki, and Toshiaki Ikeda, Otsu, both of Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Aug. 12, 1976, Ser. No. 713,686
Claims priority, application Japan, Sep. 8, 1975, 50-109289; Sep. 8, 1975, 50-109290
Int. Cl.[2] G01N 7/06, 15/00
U.S. Cl. 364—509 11 Claims



1. An apparatus for determining the amount of oil in deballasting water and tank cleaning water that has been discharged from a travelling tanker during the navigation of a distance extending from a point of navigation at a time t_1 to another point of navigation at a time t_2 within a given distance backward of said another point of navigation, said apparatus comprising:

an oil meter for measuring the concentration of oil in said water at a first time t_1 and a second time t_2, said oil meter providing a signal indicative of said concentrations;

a flow meter for measuring the flow rate of said water at said first time t_1 and said second time t_2, said flow meter providing a signal indicative of said flow rates;

a first multiplier for multiplying said concentration signal from said oil meter by said flow rate signal from said flow meter at said times, said first multiplier providing an output signal indicative of the instantaneous rate of discharge of oil at said time t_1 and at said time t_2;

a first divider for dividing said output signal at said time t_1 from said first multiplier by a navigating velocity at said time t_1 of said tanker at said time t_1 of determining said flow rate and said oil concentration so as to obtain an analog signal indicative of an incremental quantity of discharged oil at said time t_1, said first divider providing said analog signal indicative of said incremental quantity;

a delay for delaying said analog signal that indicates said incremental quantity of discharged oil at said time t_1 for a period of time $(t_1 - t_2)$ required for said tanker to travel a predetermined distance;

a second multiplier for multiplying the delayed analog signal indicative of said incremental quantity of discharged oil at said time t_1 by another navigating velocity at said time t_2 to correct said delayed signal indicative of said incremental quantity at said time t_1 to a signal indicative of the instantaneous rate of discharge of oil at said time t_1 at said another velocity at said time t_2;

a subtractor for providing an output signal indicative of subtracting said signal indicative of said instantaneous rate of discharge of oil at said time t_1 at said another velocity at said time t_2 obtained by said correction from said first multiplier output signal indicative of said instantaneous rate of discharge of oil at said time t_2 said subtracting occuring when said output signals from said first and second multipliers are obtained by said subtractor; and

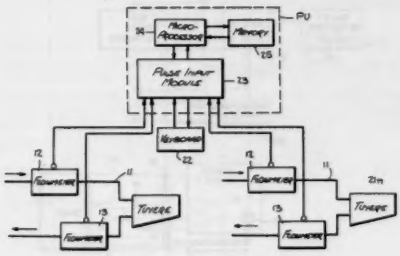
an integrator for integrating said output signal from said subtractor to obtain the quantity of oil discharged from the travelling tanker within said predetermined distance within said time period $(t_1 - t_2)$.

4,118,780

TECHNIQUE FOR MONITORING FLOW RATE DIFFERENCES IN WATER COOLING CONDUIT

Toru Hirano, Yokohama, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 761,242
Claims priority, application Japan, Jan. 29, 1976, 51-8915
Int. Cl.[2] G01F 1/08; G06F 15/20
U.S. Cl. 364—510 4 Claims



1. A system for detecting leakage from a flow conduit having an input line and an output line through which line water is supplied to a device, said system comprising:

A. a pair of flowmeters interposed, respectively, in said input and output lines, each of said flowmeters producing an output signal whose frequency is a function of flow rate, said flowmeters being subject to instrument error whereby the same amount of test water flowing through both flowmeters results in flowmeter output signals f_1 and f_2 which differ slightly in frequency, the ratio of f_1 to f_2 representing the instrument error constant;

B. a microprocessor;

C. a memory associated with said microprocessor, said memory having stored therein said instrument error constant; and

D. an input module coupling said flowmeters to said microprocessor to apply as input data thereto the frequencies of the output signals resulting from the flow of line water in said input and output lines, said microprocessor determining the frequency difference between said signals and consulting said memory to effect a correction in said frequency difference in accordance with said instrument error constant to provide an output that is indicative of leakage and is independent of said instrument error.

4,118,781

VALLEY SENSOR FOR AN ELECTROPHORETIC ANALYZER

Donald P. Brezinski, Corning, N.Y., and William E. Powell, Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed May 24, 1977, Ser. No. 800,005
Int. Cl.[2] G01D 9/28
U.S. Cl. 364—525 6 Claims

1. An analyzer for electrophoretic samples comprising:

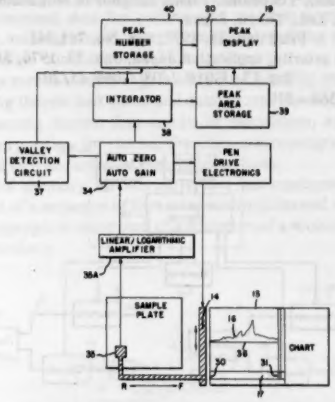
a source of analysis energy,

a sample stage movable linearly with respect to said source of analysis energy to scan a sample across said source,

a detector of analysis energy producing an output representing the optical characteristics across said sample including extremities in said characteristics,

a nonlinear differentiator, the output of said detector being applied to said nonlinear differentiator to produce an output signal having a magnitude at said extremities which

is substantially independent of the magnitude of the output of said detector, and

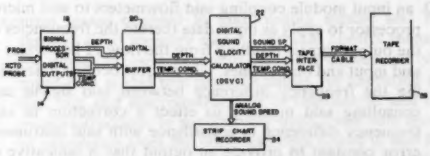


pulse shaping circuitry, the output of said nonlinear differentiator being applied to said circuitry to produce an output marking said extremities in the output of said detector.

4,118,782
DIGITAL SOUND VELOCITY CALCULATOR

Royce H. Allen, Centerville, Utah; Jerry L. Sutton; Dan M. Griffin; Hal W. Frye, and Joseph G. Colborn, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 24, 1977, Ser. No. 780,750
Int. Cl.² G01H *5/00*; G01P *3/00*
U.S. Cl. 364—565 **7 Claims**



1. Apparatus for providing a profile of the velocity of sound in a liquid media comprising:

means for passively sensing the variables temperature, conductivity and depth at different levels in said media;

means for representing each of said sensed variables in the form of digital numbers;

digital calculating means receiving said variables in their respective digital forms for providing digital outputs which represent the sound velocity in said liquid media at each of said levels;

storage means included in said digital calculating means for storing a plurality of predetermjned coefficients and a plurality of predetermined constants;

multiplication means included in said digital calculating means for sequentially forming a plurality of terms, each of said terms including the product of one of said received variables and one of said coefficients;

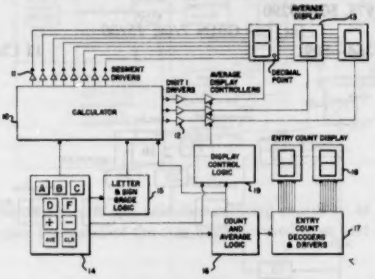
addition means included in said digital calculating means for adding one of said terms and one of said constants, and for forming one of said digital outputs by adding all of said terms and at least one of said constants and;

recording means coupled to said digital calculating means for making a real-time record of the sound velocity and depth at each of said levels.

4,118,783
DIGITAL GRADE AVERAGER

William L. Collins, 422 Forest St., Marion, Ohio 43302

Filed Feb. 7, 1977, Ser. No. 766,371
Int. Cl.² G06F *15/02, 15/20*
U.S. Cl. 364—734 **9 Claims**



1. Apparatus for adding the averaging grades selected from a series of letters of descending grade value separated from each other and augmented or decreased by plus and minus signs comprising binary coded means for converting each letter into a digit in a consecutive series of descending values, means for converting plus and minus signs into a decimal fraction less than half of the difference between successive digits, binary coded means connected to the output of said letter converting means and to the output of said sign converting means for adding those digits corresponding to the selected grades and for adding algebraically thereto the fractions corresponding to the plus and minus signs associated with the selected grades, binary coded means connected to the input of said adding means for counting the number of selected grades added, decoding means connected to the output of said counting means for converting the binary coded grade count to decimal digits, means connected to the output of said decoding means for displaying those digits, and means connected to the output of said adding means and to the output of said counting means for averaging the selected grades by dividing the binary coded sum of the selected grades by the binary coded count of grades added.

4,118,784
DIFFERENTIAL DFT DIGITAL FILTERING DEVICE

Henri J. Nussbaumer, LaGaude, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,695
Claims priority, application France, Feb. 26, 1976, 76 05938
Int. Cl.² G06F *7/38*
U.S. Cl. 364—724 **8 Claims**

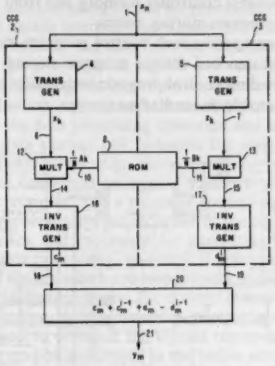
1. A filtering device for filtering a signal $x(t)$ which is represented in the form of digitally expressed samples x_n, said device performing a filtering function defined by a set of digital coefficients $[a_n]$, and characterized in that it includes:

a. an input means to which said samples x_n are applied,

b. splitting means connected to said input means and separating the stream of said samples x_n into blocks of predetermined length,

c. at least two circular convolution function generators, each receiving said blocks of samples and signals representing said set of coefficients and performing circular convolutions between each of said blocks and said set of coefficients, making use of one function generator operating according to the so-called normal discrete Fourier transform and the other one or more function generators operating according to modified discrete Fourier transform functions, and

d. combination means responsive to all said function generators for combining the outputs of said generators to generate signals representing samples of the desired filtered signal.

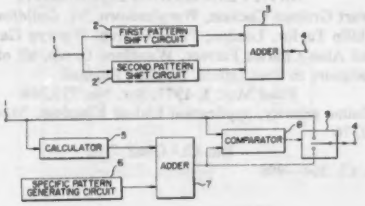


4,118,785

METHOD AND APPARATUS FOR DIGITAL ATTENUATION BY PATTERN SHIFTING

Kazuto Izumi, and Kazuo Izumi, both of Yokohama, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Continuation of Ser. No. 507,812, Sep. 20, 1974, Pat. No. 4,004,140. This application Jul. 1, 1976, Ser. No. 701,574
Claims priority, application Japan, Oct. 8, 1973, 48-113109
The portion of the term of this patent subsequent to Jan. 18, 1994, has been disclaimed.
Int. Cl.[2] G06F *7/39*
U.S. Cl. 364—754 **1 Claim**



1. A digital attenuator comprising a plurality of pattern shift circuits, means for applying an input PCM signal to said plurality of pattern shift circuits for shifting said input PCM signal to the lower digit side, a specific pattern generating circuit for generating an integer pattern, an adder connected to said specific pattern generating circuit and to said pattern shift circuits, a comparator connected to compare the output of said adder with said input PCM signal, and a selector responsive to the output of said comparator for selecting the lower value signal of either of said input PCM signal or the output of said adder.

4,118,786

INTEGRATED BINARY-BCD LOOK-AHEAD ADDER

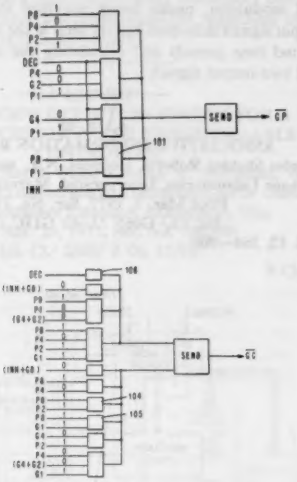
Samuel R. Levine, Poughkeepsie; Shanker Singh, Fishkill, and Arnold Weinberger, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 10, 1977, Ser. No. 758,378
Int. Cl.[2] G06F *7/50*
U.S. Cl. 364—783 **4 Claims**

1. A logic system for performing addition of two numbers, in one of a plurality of number bases, each number consisting of binary-coded representation of at least one digit, comprising:

signalling means for indicating the number base being utilized;

first logic means for signalling a carry C into said one digit; and



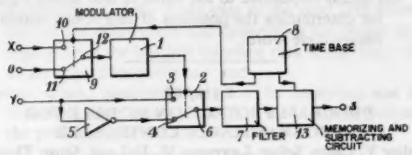
second logic means responsive to said signalling means and to said first logic means for implementing sum bits *Si* by logically solving the equation $Si = Xi\ C + Yi\ C$ or its logical equivalent, where *Xi* and *Yi* are predetermined logical combinations of the output of said signalling means and of A*i* and B*i*, where A*i* and B*i* are respective bits of arithmetic weight *i* of said digits.

4,118,787

ANALOG MULTIPLIER ERROR CORRECTOR, NOTABLY FOR PRECISION WATTMETERS

Daniel Arnoux, Saint Germain en Laye, France, assignor to Societe Chauvin Arnoux, Paris, France

Filed Feb. 7, 1977, Ser. No. 766,481
Claims priority, application France, Feb. 11, 1976, 76 03766
Int. Cl.[2] G06G *7/161*; G01R *11/32*
U.S. Cl. 364—842 **9 Claims**



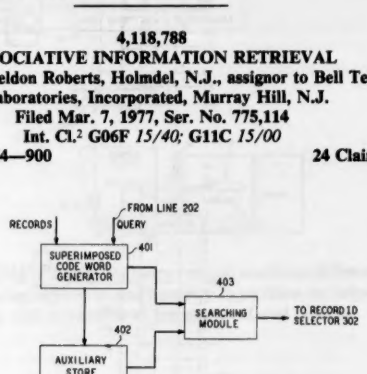
1. Error correcting device for an analog multiplier utilizing the time-division multiplication method and comprising a modulator, a first switch and a low-pass filter, said modulator being adapted to generate a high-frequency square wave signal of which the cyclic ratio is proportional to a first analog input signal when said first input signal is fed to the input of said modulator, said first switch being responsive to said cyclic ratio and receiving on a first input a second analog input signal and on a second input said second input signal but having its sign changed, said filter being coupled to the output of said switch and delivering a continuous output signal substantially

equal to the average value of the instantaneous scalar product of said first and second input signals, wherein a low-frequency time-base is provided for delivering pulses to the control terminal of a second switch in order to switch during a first time period a first input receiving the first input signal, and in a second time period a second input receiving a zero reference signal, the output of said switch being coupled to the input of said modulator, means being provided for memorizing the output signals delivered by said filter at the end of said first and second time periods and calculating the difference between said two output signals.

4,118,788
ASSOCIATIVE INFORMATION RETRIEVAL

Charles Sheldon Roberts, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 7, 1977, Ser. No. 775,114
Int. Cl.² G06F *15/40*; G11C *15/00*
U.S. Cl. 364—900 **24 Claims**



1. Apparatus for generating a binary superimposed code word representative of a record containing units of information from which one or more attribute values may be derived, comprising:

means for assigning a unique intermediate code to each of said attribute values;

means for converting each of said intermediate codes to a corresponding binary code word having a total of *b* bits of which exactly K bits are ONES; and

means for combining said binary code words to form said superimposed code word,

wherein said converting means includes:

(a) means for mapping said intermediate code word into an integer value lying within a predefined range;

(b) means for generating a particular sequence of pseudo-random numbers in response to said integer value;

(c) means for scaling each of said pseudo-random numbers in said sequence to a value between 0 and b-1; and

(d) means responsive to the value of said scaled numbers for determining the positions of said K bits within said binary code word.

4,118,789
PROGRAM PROTECTION MODULE FOR PROGRAMMABLE CONTROLLER

Walter V. Casto, Solon; Lawrence W. DeLong, Stow; Theodore J. Markley, Mentor, and Odo J. Struger, Chagrin Falls, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

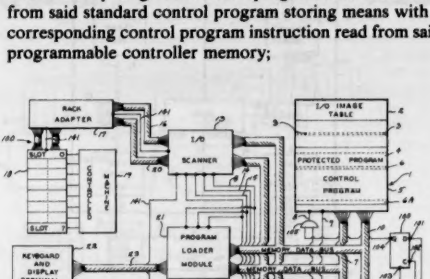
Filed Jun. 6, 1977, Ser. No. 804,146
Int. Cl.² G06F *13/00*
U.S. Cl. 364—900 **9 Claims**

1. In a programmable controller having a memory which stores a control program, a processor which operates in a run mode to read out the control program instructions and execute them, and I/O interface means coupled to said memory and said processor for connecting the programmable controller to sensing devices and operating devices on a machine to be controlled, the improvement therein of a program protection module which comprises:

means for storing a standard control program which comprises a plurality of control program instructions;

means for reading control program instructions from said programmable controller memory and from said standard control program storing means;

means for comparing each control program instruction read from said standard control program storing means with a corresponding control program instruction read from said programmable controller memory;



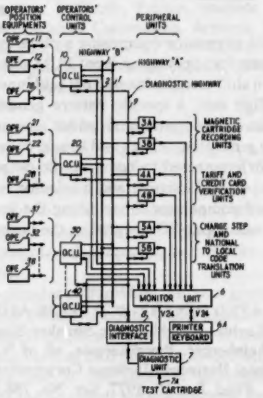
means coupled to said comparing means for indicating that a control program instruction read from said programmable controller memory is not identical to its corresponding control program instruction read from said standard control program storing means; and

a status register coupled to said comparing means for storing a status bit which indicates that all control program instructions in said standard control program storing means are identical to their corresponding control program instructions in said programmable controller memory.

4,118,790
DATA PROCESSING EQUIPMENT

Stewart Graham Cockett, Worplesdown, Nr. Guildford; Jeffrey Philip Taylor, London; Peter Craven, Welwyn Garden City, and Alan Charles Farmer, Woodford Green, all of England, assignors to Post Office, London, England

Filed Mar. 1, 1977, Ser. No. 773,264
Claims priority, application United Kingdom, Mar. 4, 1976, 8672/76
Int. Cl.² G06F *7/02*
U.S. Cl. 364—900 **9 Claims**



1. Data processing equipment having a plurality of on-line stations, the equipment including a data entry means and data

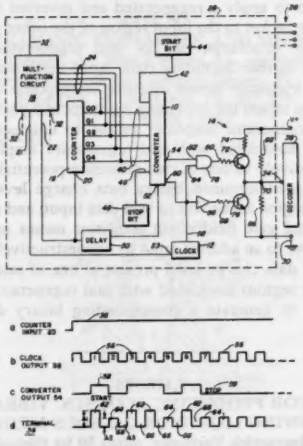
utilisation means at each station, a plurality of data handling units, a main data storage unit, and a plurality of control units each including means for recording in response to the data entry means details of a required data processing operation, each control unit including means for generating in response to the recorded details interrogation signals for the data handling units, means for receiving data from the data handling units in response to the interrogation signals and recording the data, means for applying signals from the means for receiving data to the data utilisation means, and means for generating signals representing the data processing operation and applying them to the main data storage unit, wherein the main data storage unit includes two independent recording means each including a buffer store connected to receive signals from the control units, a data recorder, and a recorder control means for controlling the recording by the recorder of the signals stored in the buffer stores, and the means for generating signals representing the data processing operation is arranged to generate two separate signals which are respectively applied to the two independent recording means, the control means of each independent recording means including comparison and testing means arranged to compare the signals representing the data processing operation and stored in the buffer stores of the two recording means and to perform a test of the validity of the signals stored in the buffer stores, the control means being arranged to permit the recording of the signals stored in the buffer stores by the data recorder, if they are the same in both of the recording means.

4,118,791

MULTI-LEVEL ENCODING SYSTEM

Richard Slaughter Swain, Des Plaines, Ill., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Filed Apr. 25, 1977, Ser. No. 790,293
Int. Cl.[2] G06F *13/00, 3/00*
U.S. Cl. 364—900 **16 Claims**



1. In a circuit having a binary memory with a plurality of stages each of which may be in a first or a second logic state and an output terminal available for providing thereon an indication of the binary data stored in said memory, a frequency independent encoder, comprising:

means for generating a succession of clock pulses;

means coupled to said memory and responsive to said clock pulses for developing a stream of binary data comprising a series of first and second state signals respectively corresponding to the first and second logic states of said memory stages, each of said series of first and second state signals being associated with a respective one of said clock pulses; and

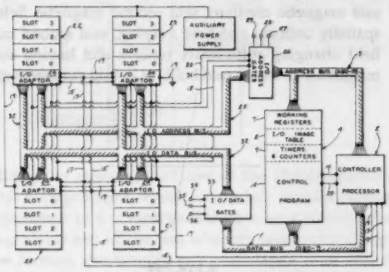
means responsive to said clock pulses and to said stream of binary data for providing a digital, composite output signal to the output terminal representative of the stored data and the clock pulses, said composite providing means generating first, second and third data signals respectively in response to clock pulses associated with said first state signals, clock pulses associated with said second state signals, and the periods between clock pulses, said first, second and third data signals being discernibly different from one another and being provided regardless of the frequency of said clock pulses.

4,118,792

MALFUNCTION DETECTION SYSTEM FOR A MICROPROCESSOR BASED PROGRAMMABLE CONTROLLER

Odo J. Struger, Chagrin Falls; Timothy E. McAdams, Willowick, and Ernst Dummermuth, Chesterland, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Apr. 25, 1977, Ser. No. 790,590
Int. Cl.[2] G06F *9/06, 11/00*
U.S. Cl. 364—900 **8 Claims**



1. In a programmable controller having a controller processor which connects to a plurality of separate I/O interface racks through an I/O address bus and an I/O data bus, the improvement therein comprising:

means at each of said I/O interface racks for detecting a malfunction condition thereat and generating a fault indicating logic signal when such a malfunction condition is detected;

a logic gate at each of said I/O interface racks having one input connected to receive said fault indicating logic signal, a second input and an output;

an I/O fault line which connects in daisy chain fashion between said I/O interface racks and to said controller processor, said I/O fault line connecting the output of the logic gate in each of said I/O interface racks with the second input of the logic gate in the next I/O interface rack in the daisy chain and connecting the output of the logic gate in the last I/O interface rack in the daisy chain to the controller processor; and

means at said controller processor for receiving said fault indicating logic signal on said I/O fault line and indicating the presence of a malfunction.

4,118,793

GRADIENTLESS PROPULSION OF MAGNETIC BUBBLE DOMAINS USING MODULATED IN-PLANE FIELDS

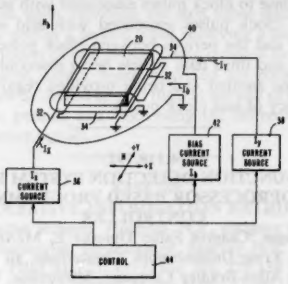
Bernell Edwin Argyle, Putnam Valley, N.Y.; Pieter Dekker, Kortenhoef, Netherlands, and John Casimir Slonczewski, Katonah, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1977, Ser. No. 758,887
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—30 **25 Claims**

1. An apparatus for moving magnetic bubble domains in a

magnetic medium in the absence of magnetic field gradients acting on said bubbles, including:

means for applying a first magnetic field in the plane of said medium,



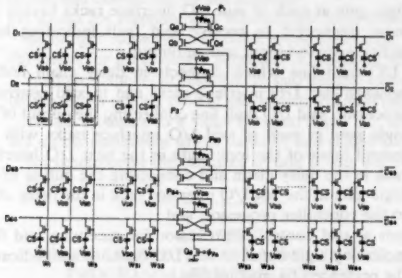
means for applying a second magnetic field in the plane of said magnetic medium, said second magnetic field being spatially uniform and time varying, said second magnetic field changing sufficiently rapidly and having sufficient magnitude to move said bubbles in said magnetic medium.

4,118,794

MEMORY ARRAY WITH LARGER MEMORY CAPACITORS AT ROW ENDS

Fumio Mizuno, Kodaira, and Masamichi Ishihara, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 15, 1977, Ser. No. 851,691
Claims priority, application Japan, Nov. 19, 1976, 51/138340
Int. Cl.² G11C *11/24*
U.S. Cl. 365—149 **3 Claims**



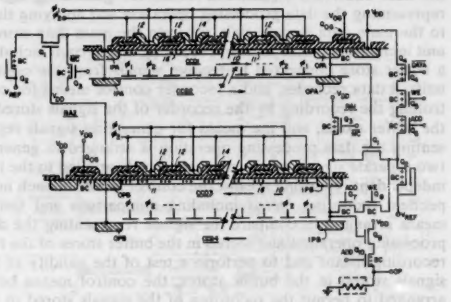
1. A dynamic storage device comprising a memory cell array constructed of a plurality of memory cells arrayed on a semiconductor substrate, said each memory cell including a capacitor which is made up of a semiconductor region in a surface of said semiconductor substrate and a conductor layer formed on said semiconductor region through an insulating film and an insulated gate field-effect transistor whose source region or drain region is connected to said semiconductor region, the capacitors of the memory cells at an end portion of said memory cell array having capacitances larger than those of the capacitors of the memory cells at an inner portion of said memory cell array.

4,118,795

TWO-PHASE CCD REGENERATOR - I/O CIRCUITS

Robert Charles Frye, Brighton, Mass.; Alan Harry Katz, New Orleans, La., and Charles Robert Hewes, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 27, 1976, Ser. No. 718,243
Int. Cl.² G11C *21/00, 7/00, 11/34*
U.S. Cl. 365—222 **15 Claims**



1. In a charge coupled device memory including a pair of charge coupled device shift register structures each having a data input region and a data output region, and phased clock pulse means coupled to said shift register structures for shifting binary data charge packets in said shift register structures;

first and second insulated gate field effect transistor charge regenerator amplifier means respectively cross coupling said output regions with said input regions, each of said regenerator amplifier means being operable to sense the level of binary data charge packets from the output region of one of said shift register structures and in response thereto to apply a regenerated and inverted binary data charge packet to the input region of the other of said shift register structures; one of said regenerator amplifier means further including data input insulated gate field effect transistor means operable in response to data and address inputs for providing a conductive path bypassing said regenerator amplifier means to connect the input region associated with said regenerator amplifier means alternatively to one of two reference potentials for entering a predetermined binary data charge level into said input region according to said data input; and data output insulated gate field effect transistor means operably responsive to an address input to nondestructively sense the binary data charge level present at one of said input and output regions associated with said regenerator amplifier means to generate a corresponding binary data output signal.

4,118,796

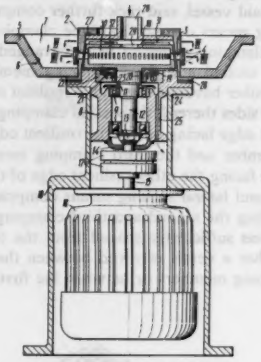
DEVICE FOR PRODUCING ACOUSTIC VIBRATION IN FLOWING LIQUID OR GASEOUS MEDIUM

Vladimir Matveevich Varlamov, ulitsa 50 let Oktyabrya, 1, kv. 16, Zlatoust Chelyabinskoi oblasti, U.S.S.R.

Filed Jun. 29, 1977, Ser. No. 811,313
Int. Cl.² B01F *11/02*
U.S. Cl. 366—124 **3 Claims**

1. A device for producing acoustic vibration in a flowing liquid or gaseous medium, comprising: a housing; a stator secured in said housing; a rotor arranged coaxially with said stator in the medium; a side surface of said rotor; at least one row of holes provided on said side surface of said rotor; a side surface of said stator; rows of holes in a number corresponding to that of said rows of holes of said rotor, provided on said side surface of said stator; the number of said holes in each row of holes of said rotor being less than the number of holes in each row of holes of said stator; end faces of said rotor; an opening

provided in one of said end faces of said rotor; a closed cavity of said rotor; a gap between said rotor and said stator; a pump to continuously circulate said medium through said opening provided in said end face of said rotor, said closed cavity of said rotor, said rows of holes of said rotor, said gap between said rotor and said stator, and said rows of holes of said stator; an electromotor to rotate said rotor so as to produce local



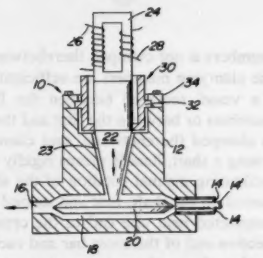
compression of said medium of said holes of said stator as a result of periodic alignment of said rows of holes of said rotor with those of said stator; an oscillator of an elastically deformable material, encompassing said stator, arranged in immediate proximity to said side surface of said stator, opposite said rows of holes, and intended to convert said local compression of said medium into mechanical oscillation to interact with said medium, whereby acoustic vibration is produced.

4,118,797

ULTRASONIC EMULSIFIER AND METHOD

William B. Tarpley, Jr., West Chester, Pa., assignor to Energy and Minerals Research Co., Kennett Square, Pa.

Filed Oct. 25, 1977, Ser. No. 845,177
Int. Cl.[2] B01F *11/02*
U.S. Cl. 366—127 **11 Claims**



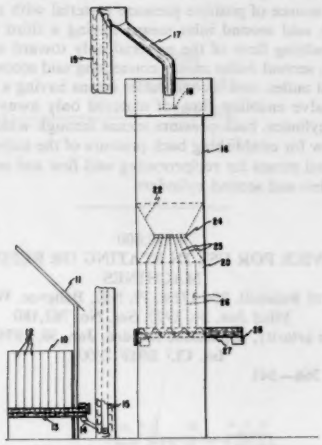
1. A method of emulsifying flowable immiscible materials comprising simultaneously directing the materials to be emulsified through a chamber, emulsifying said materials by inducing cavitation in the materials while said materials are moving through said chamber by contacting said materials with an active region of at least one resonant vibration-transmitting member, positioning said member in said chamber so that there are no inactive regions of vibratory energy through which the materials can flow and so that the materials enter said chamber adjacent said active region, inhibiting the formation of a standing wave in at least a major portion of the flowable materials flowing through said chamber, supporting said member and a source of vibratory energy connected thereby by a mount which minimizes loss of vibratory energy to the support.

4,118,798

METHOD OF MIXING FERTILIZER

Clayton S. Ellsworth, 203 S. 17th St., Norfolk, Nebr. 68701

Division of Ser. No. 631,894, Nov. 14, 1975, abandoned. This application Aug. 25, 1977, Ser. No. 827,838
Int. Cl.[2] B01F *7/00*
U.S. Cl. 366—156 **2 Claims**



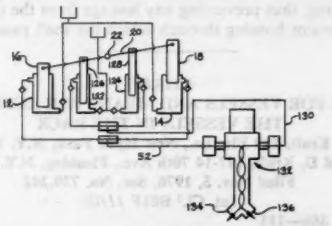
1. Method of mixing a fertilizer or the like composed of a plurality of ingredients which comprises serially delivering said ingredients to a compartmented bin, successively placing each ingredient into all the bins whereby layers of said ingredients are formed, discharging said ingredients from said compartments into a mixing auger running beneath said compartments in consecutive order whereby said ingredients are partially mixed, delivering said partially mixed ingredients from said auger to a discharge means, mixing said ingredients a second time by discharging the ingredients over a diffuser means and mixing the ingredients a third time by running said ingredients through a discharge auger.

4,118,799

APPARATUS FOR TRANSFERRING METERED QUANTITIES OF MATERIAL FROM ONE LOCATION TO ANOTHER

Wallace F. Krueger, 4401 Merriweather Rd., Toledo, Ohio 43623

Continuation of Ser. No. 670,137, Mar. 25, 1976, abandoned. This application Jul. 14, 1977, Ser. No. 815,527
Int. Cl.[2] G05D *11/00*
U.S. Cl. 366—161 **15 Claims**



1. Apparatus for metering viscous material comprising means for establishing a source of material at positive pressure above atmospheric pressure, an outlet where the material is at a higher pressure, a first cylinder having a first ram reciproca-

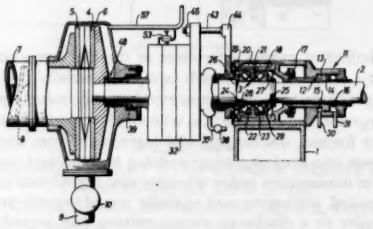
ble therein, first inlet means connecting said source of positive pressure material with said first cylinder, said first inlet means having a first ball check valve enabling flow of the material only toward said first cylinder, first outlet means connecting said first cylinder with said outlet, said first outlet means having a second ball check valve enabling flow of the material only away from said first cylinder, a second cylinder having a second ram reciprocable therein, second inlet means connecting said source of positive pressure material with said second cylinder, said second inlet means having a third ball check valve enabling flow of the material only toward said second cylinder, second outlet means connecting said second cylinder with said outlet, said second outlet means having a fourth ball check valve enabling flow of material only away from said second cylinder, back-pressure means through which material must flow for establishing back pressure of the material at said outlet, and means for reciprocating said first and second rams in said first and second cylinders.

4,118,800

DEVICE FOR USE IN BEATING OR REFINING MACHINES

Rolf Bertil Reinhall, 834 171st. Pl. NE., Bellevue, Wash. 98008

Filed Jan. 24, 1977, Ser. No. 762,180
Claims priority, application Sweden, Jan. 30, 1976, 76010180
Int. Cl.[2] B01F *7/00*
U.S. Cl. 366—341 **9 Claims**



1. Sealing device for use in defibrating apparatus and the like for fibrous and/or organic materials, including a defibrator housing (6) which is maintained at a pressure greater than atmospheric and encloses two grinding discs (4, 5) mounted to rotate with respect to one another, at least one (4) of the discs being supported by a drive shaft (2) which passes through an opening in the housing, characterized by a pump enclosed within a housing (32), preferably of the multi-stage type, having its impellers (33–35) fixed on the shaft (2) and enclosed in said pump housing (32) having a flange (39) which surrounds the shaft (2) at a spaced distance therefrom so as to define a gap (49) extending into the interior of the housing, so that the fluid raised by the pump (32) to a pressure greater than that prevailing within the defibrator housing (6) is propelled through the gap (49) between said flange and the shaft and into the defibrator housing, thus preventing any leakage from the opening in the defibrator housing through which the shaft passes.

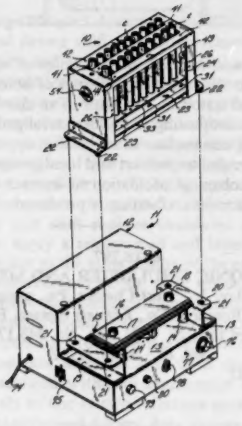
4,118,801

RACK FOR VESSELS AND MEANS FOR AGITATING THE VESSELS IN THE RACK

Jack A. Kraft, 119 Elm La., New Hyde Park, N.Y. 11040, and Harold D. Kraft, 147-14 70th Ave., Flushing, N.Y. 11367

Filed Nov. 5, 1976, Ser. No. 739,242
Int. Cl.[2] B01F *11/00*
U.S. Cl. 366—111 **12 Claims**

1. A rack for holding at least one vessel for agitation of the vessel, said rack comprising: resilient clamping means comprising resilient members formed of resilient material for holding said vessel to said rack, positive-action movable means attached to said clamping means for moving said resilient members against the vessel at a position remote from the bottom thereof to resiliently hold the vessel vertically in place, laterally movable agitating means for engaging the vessel near the bottom thereof for imparting a lateral movement to the bottom of said vessel, said clamping means clamping said vessel to said rack and defining a null point while said lateral movement is imparted to said vessel, said rack further comprising a frame, said clamping means comprising three clamping members, a first of the clamping members being arranged in the frame between the second and third clamping members, the first clamping member having a respective resilient edge at each of two opposite sides thereof, the second clamping member having a resilient edge facing one of the resilient edges of the first clamping member and the third clamping member having a resilient edge facing the other resilient edge of the first clamping member and lateral shifting means comprising means for laterally shifting the second and third clamping members between positions sufficiently spaced from the third clamping member so that a vessel received between the first and the second clamping members or between the first and the third



clamping members is not clamped therebetween and positions in which the clamping members are sufficiently close to each other that a vessel received between the first and second clamping members or between the first and the third clamping members is clamped therebetween, said clamping means further comprising a shaft, handle means rigidly mounted on the shaft for facilitating manual rotation of the shaft, a cross bar rigidly mounted on the shaft, first and second lever arms each pivotally connected near one end to the cross bar at a point near a respective end of the cross bar and each pivotally connected near the other end to a respective one of the first and second clamping members, one of the lever arms extending upwardly from the cross bar and the other lever arm extending downwardly from the cross bar, whereby a vessel received between the first and the second clamping members or between the first and the third clamping members is clamped therebetween when the shaft is rotated sufficiently that a line connecting the points of pivotal connection of the lever arms to the cross bar has rotated from an orientation non-parallel in a first rotational sense to a plane common to the resilient edges of the second and third clamping members to an orientation non-parallel in a second rotational sense to said common plane.

DESIGN PATENTS

GRANTED OCT. 3, 1978

ERRATA

For CLASS	See PATENT NO.
D24–023	249,802

DESIGNS

OCTOBER 3, 1978

249,746
NOVELTY BEANIE
Robert F. Wildman, R.D. #1, Box 88, Troy, N.Y. 12180
Filed Dec. 1, 1976, Ser. No. 746,593
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—250

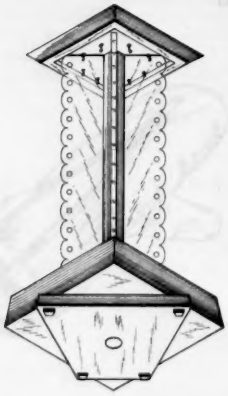
249,747
SANDAL
Darryl M. Galen, 3826 Faversham Rd., University Heights, Ohio 44118
Filed Nov. 4, 1976, Ser. No. 738,882
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270

249,748
ATHLETIC SHOE
Hideki Kitamura, Scarborough, N.Y., assignor to C. Itoh & Co. (America) Inc., New York, N.Y.
Filed Jun. 30, 1976, Ser. No. 701,146
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

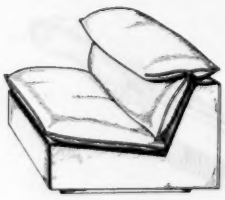
249,749
DOUBLE-LINED MITTEN
Charles C. Wanous, 4001 Overlook Dr., Minneapolis, Minn. 55437
Filed Jan. 22, 1976, Ser. No. 651,604
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—365

249,750
HAND-HELD CARPET GROOMER
Bernard A. Erickson, Rockford, Ill., assignor to Groom Industries, Inc.
Filed Mar. 3, 1977, Ser. No. 774,011
Term of patent 14 years
Int. Cl. D4—*01, 02;* D7—*05*
U.S. Cl. D4—12

249,751
DISPLAY STAND FOR JEWELRY
Kurt Gruenewald, Utica, N.Y., assignor to Mele Manufacturing Co., Inc.
Filed Dec. 15, 1976, Ser. No. 750,711
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—20



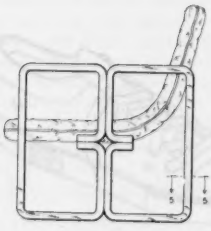
249,752
SEAT OR SIMILAR ARTICLE
Jens Juul Eilersen, 5485 Skamby, Fyn, Denmark
Filed Oct. 14, 1976, Ser. No. 732,433
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 7611963
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26



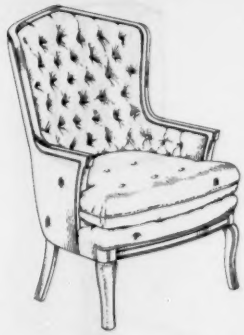
249,753
HANGING CHAIR
Julius A. Pratt, 507 Maple Ave., Greeneville, Tenn. 37743
Filed Dec. 23, 1976, Ser. No. 753,942
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—54

249,754
CHAIR OR SIMILAR ARTICLE
Stanley P. Nash, Johnson Creek, Wis., and David P. G. Williams, Englewood, N.J., assignors to Schweiger Industries, Inc., Jefferson, Wis.
Filed Nov. 17, 1976, Ser. No. 742,654
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—62

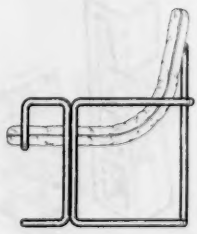
249,755
CHAIR
Steven Douglas Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Filed Apr. 16, 1976, Ser. No. 677,616
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67



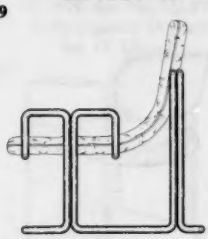
249,756
CHAIR
Mike T. Claman, Scarsdale, N.Y., assignor to Lewittes Furniture Enterprises, Inc., New York, N.Y.
Filed Dec. 2, 1976, Ser. No. 746,991
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—67



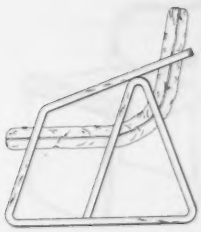
249,757
CHAIR
Steven Douglas Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Filed Apr. 16, 1976, Ser. No. 677,614
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



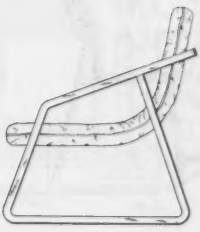
249,758
CHAIR
Steven Douglas Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Filed Apr. 16, 1976, Ser. No. 677,613
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



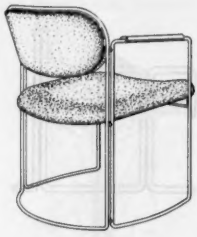
249,759
CHAIR
Steven Douglas Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Filed Aug. 9, 1976, Ser. No. 712,904
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



249,760
CHAIR
Steven Douglas Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Filed Aug. 9, 1976, Ser. No. 712,906
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



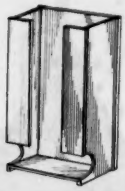
249,761
CHAIR
Earl H. Koepke, Youngstown, Ohio, assignor to GF Business Equipment, Inc., Youngstown, Ohio
Filed Feb. 7, 1977, Ser. No. 766,492
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



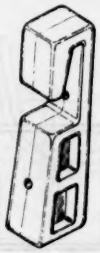
249,762
CHAIR
Earl H. Koepke, Youngstown, Ohio, assignor to GF Business Equipment, Inc., Youngstown, Ohio
Filed Feb. 7, 1977, Ser. No. 766,493
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78

249,763
CHAIR
Hilton A. Gill, 2809 S. 11th St., Sheboygan, Wis. 53081
Filed Feb. 14, 1977, Ser. No. 768,045
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78

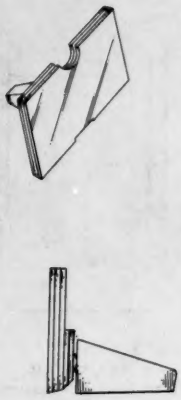
249,764
CIGARETTE PACKAGE DISPENSER
Margery Burklacich, 18840 Colt Springs Dr., Reno, Nev. 89506
Filed Jul. 11, 1977, Ser. No. 814,324
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



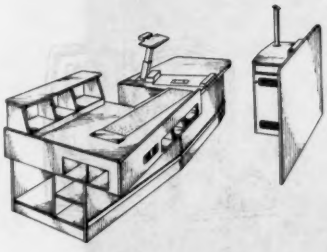
249,765
WALL MOUNTED BRACKET FOR HOLDING A FLOWER POT
John B. Wilson, Hall Court, Banner Elk, N.C. 28604
Continuation-in-part of Ser. No. 748,138, Dec. 6, 1976, abandoned. This application Feb. 16, 1977, Ser. No. 769,060
Term of patent 14 years
Int. Cl. D6—*06;* D8—*08*
U.S. Cl. D6—137



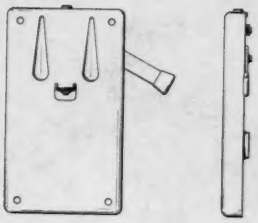
249,766
ADJUSTABLE CARD HOLDER
C. Johnny Munn, 69 S. Taft Hill Rd., Fort Collins, Colo. 80521
Filed Dec. 30, 1976, Ser. No. 755,511
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D6—140



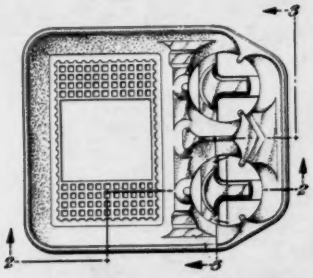
249,767
COMBINED CHECKSTAND AND CONTROL CABINET ASSEMBLY
David Duke, Azusa, Calif., assignor to Zephyr System, Inc., El Monte, Calif.
Filed Sep. 20, 1977, Ser. No. 835,178
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—143



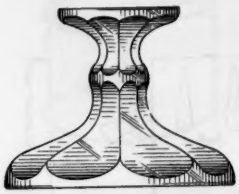
249,768
LEVER-MODEL LOW-SILHOUETTE CHAIR-TILTING CONTROL
Lon W. Pinaire, Prospect, Ky., and Robert H. Godwin, Evansville, Ind., assignors to Bliss & Laughlin Industries, Incorporated
Division of Ser. No. 582,643, Jun. 2, 1975. This application Sep. 15, 1976, Ser. No. 723,579
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



249,769
COMBINED FOOD AND BEVERAGE TRAY
Henry R. Vigue, Waterville, Me., assignor to Keyes Fibre Company
Filed Dec. 27, 1976, Ser. No. 754,258
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38

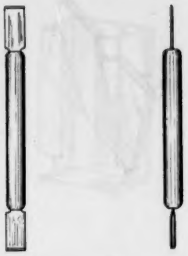


249,770
BASE FOR A BOWL
Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 544,913,, Jan. 29, 1975, which is a division of Ser. No. 397,069, Sep. 13, 1973, Pat. No. Des. 238,541. This application Jun. 18, 1976, Ser. No. 697,409
Term of patent 14 years
Int. Cl. D7—*01;* D26—*01*
U.S. Cl. D7—39



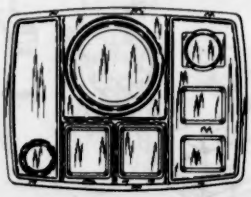
249,771
ELECTRIC GRASS TRIMMER HOUSING
Edward A. Irelan, Columbia, Mo., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Nov. 1, 1976, Ser. No. 737,436
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8

249,772
SCULPTURING TOOL
Anne T. Amiot, 2177 Simone, Dearborn Heights, Mich. 48127
Filed Jul. 23, 1976, Ser. No. 708,194
The portion of the term of this patent subsequent to Oct. 12, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. 8—14

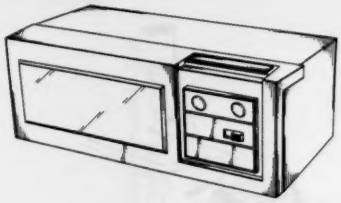


249,773
DECANTER
Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Jul. 31, 1975, Ser. No. 600,708
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—64

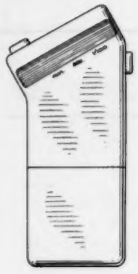
249,774
INSULATED TRAY
Richard H. Seager, Manchester, Conn., assignor to King-Seeley Thermos Co.
Filed Oct. 18, 1976, Ser. No. 733,039
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—115



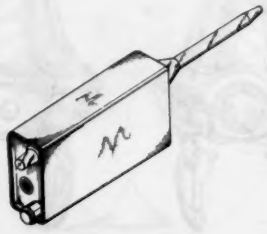
249,775
DIGITAL CLOCK
Nobuyoshi Hirosawa, Chofu, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Shinosuwa, Japan
Filed Dec. 8, 1976, Ser. No. 748,440
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



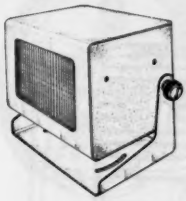
249,776
HAND-HELD STOPWATCH
Emanuel Almosnino, and David B. Chaney, both of Providence, R.I., assignors to Jon Lee, New York, N.Y.
Filed Nov. 22, 1976, Ser. No. 743,842
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—40



249,777
RADAR DETECTOR
Donald L. Roettele, and William E. Yohpe, both of Dayton, Ohio, assignors to Com General Corporation, Dayton, Ohio
Filed Dec. 20, 1976, Ser. No. 752,451
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—104



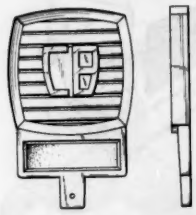
249,778
COMBINED INTRUSION DETECTOR AND ALARM
Toru Kobayakawa, Osaka, Japan, assignor to Hokuyo Automatic Co., Ltd., Osaka, Japan
Filed Apr. 15, 1977, Ser. No. 788,051
Term of patent 7 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



249,779
WRIST BAND FOR JEWELRY OR THE LIKE
Samuel M. Bobrick, 445 Monaco, Denver, Colo. 80220
Filed Sep. 10, 1976, Ser. No. 722,328
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—12

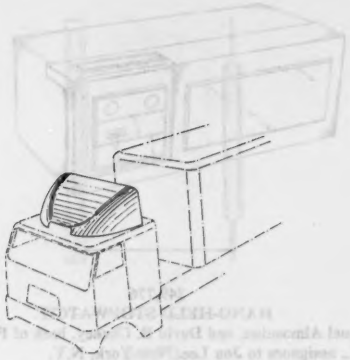
249,780
PYRAMID RING
Noel Gonzalez, 6110 N. Bernard, Chicago, Ill. 60659
Filed Oct. 22, 1976, Ser. No. 734,746
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—30

249,781
CHARM OR THE LIKE
Douglas A. Richardson, 27 Canterbury La., and William A. Richardson, 608 Snyder Ave., both of Berkeley Heights, N.J. 07922
Filed Jun. 8, 1976, Ser. No. 693,899
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81

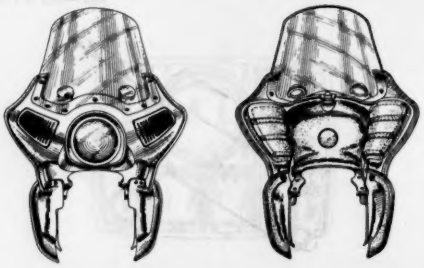


249,782
PORTABLE SIGNAL FLAG
Herbert Marcus, 635 Redding Rd., West Redding, Conn. 06896
Filed Aug. 23, 1976, Ser. No. 716,575
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—166

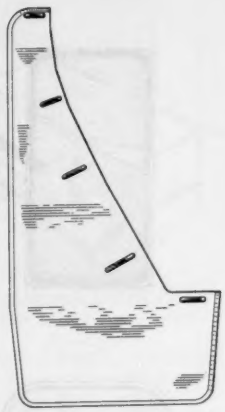
249,783
TRUCK WIND DEFLECTOR
Donald R. Herpel, 29466 Candlewood, Southfield, Mich. 48076
Filed Jul. 16, 1976, Ser. No. 705,901
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181



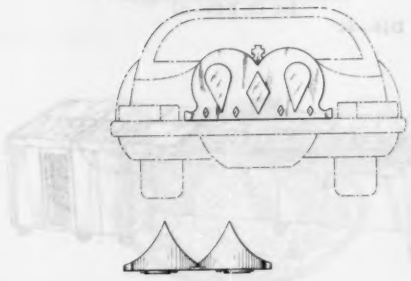
249,784
COMBINED MOTORCYCLE FAIRING WITH LOWER ATTACHMENTS
Craig W. Vetter, Rantoul, Ill., assignor to Vetter Fairing Company, San Luis Obispo, Calif.
Filed May 31, 1977, Ser. No. 802,238
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182



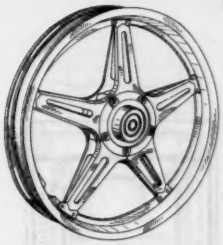
249,785
AUTOMOBILE FENDER SPLASH GUARD
Frederick Hurd, Don Mills, Canada, assignor to National Rubber Company Limited, Toronto, Canada
Filed Mar. 29, 1977, Ser. No. 782,557
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—185



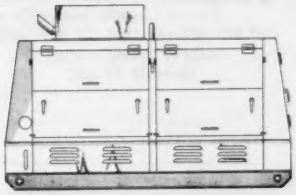
249,786
ATTACHMENT FOR THE REAR DECK OF AN AUTOMOBILE
Gene Howard, 5116 W. Monroe St., Chicago, Ill. 60644
Filed Jul. 12, 1976, Ser. No. 704,317
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—196



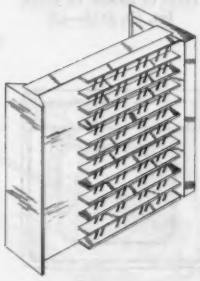
249,787
WHEEL FOR TWO-WHEELED VEHICLE
Norio Tanaka, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 23, 1977, Ser. No. 780,359
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



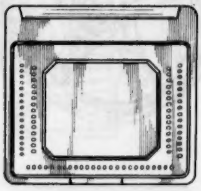
249,788
POWER GENERATOR
Shigenobu Nanjo, Yokohama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Jan. 4, 1977, Ser. No. 756,721
Term of patent 7 years
Int. Cl. D13—*01*
U.S. Cl. D13—3



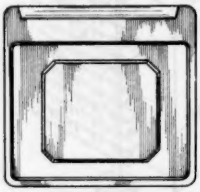
249,789
TELEPHONE CONNECTOR BLOCK
Paul V. DeLuca, Syosset, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.
Filed Mar. 31, 1977, Ser. No. 783,264
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



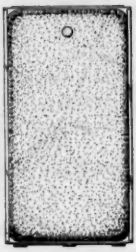
249,790
CASING FOR ELECTRONIC COMPONENTS OR THE LIKE
Geoffrey R. Ainscow, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 20, 1976, Ser. No. 734,058
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—41



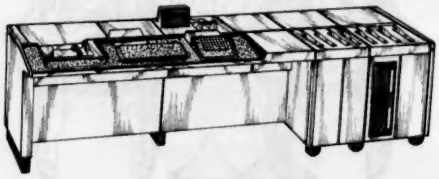
249,791
CASING FOR ELECTRONIC COMPONENTS OR THE LIKE
Geoffrey R. Ainscow, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 20, 1976, Ser. No. 734,059
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—41



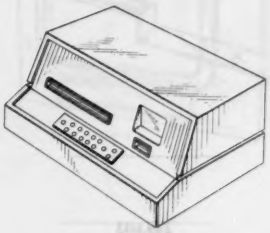
249,792
LOUDSPEAKER
Dieter Rams, Kronberg, Fed. Rep. of Germany, assignor to Braun A G, Frankfurt am Main, Fed. Rep. of Germany
Filed Feb. 26, 1976, Ser. No. 661,639
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33



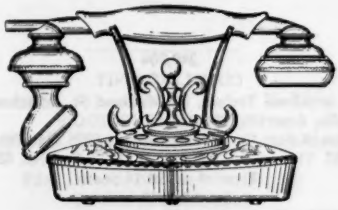
249,793
MODULAR DOCUMENT PROCESSING ENCODER
Richard G. Clayton, Detroit, and Robert C. Schade, Farmington Hills, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.
Continuation-in-part of Ser. No. 574,722, May 5, 1975, abandoned. This application Jun. 24, 1976, Ser. No. 699,431
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—44

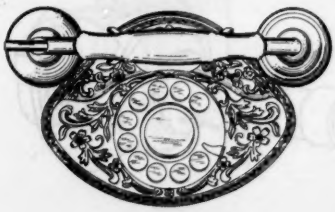


249,794
BANK-TELLER TERMINAL
Jack Howe, London, England, assignor to Chubb Integrated Systems Limited, London, England
Filed Feb. 22, 1977, Ser. No. 770,544
Claims priority, application United Kingdom, Sep. 9, 1976, 977075/76
Term of patent 14 years
Int. Cl. D14—*02;* D18—*01*
U.S. Cl. D14—45

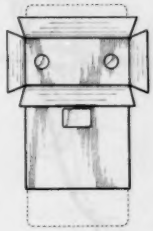


249,795
TELEPHONE OR SIMILAR ARTICLE
Paul R. Brown, 20 East 35th St., New York, N.Y. 10016, assignor to MB Royal Group, Inc., New York, N.Y.
Filed Apr. 30, 1976, Ser. No. 681,880
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—53

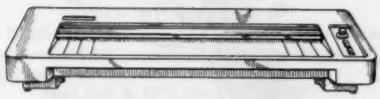




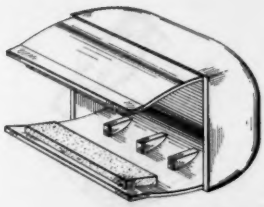
249,796
STEREOSCOPIC VIEWER AND SLIDE HOLDER
James J. Curtin, Maumee, Ohio, assignor to Penton/IPC, Inc., Toledo, Ohio
Filed Jan. 10, 1977, Ser. No. 758,178
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—12



249,797
COPYING MACHINE
John J. Van Acker, Chesterland, Ohio; Terry G. Seelenbinder, Elk Grove Village, Ill.; Richard W. Jackson, Barrington, Ill.; Eugene P. Oddo, Mt. Prospect, Ill., and Walter A. Hudson, Fox River Grove, Ill., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio
Filed Oct. 22, 1977, Ser. No. 734,852
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



249,798
FLASH DIFFUSER
Al Tureck, Skokie, Ill., and Edward R. Farber, Delafield, Wis., assignors to Sima Products Corporation, Skokie, Ill.
Filed Sep. 13, 1976, Ser. No. 722,657
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—38



249,799

TOOL FOR REMOVING A HYDRATED HYDROPHILIC CONTACT LENS FROM A STORAGE SOLUTION

Thomas J. Zoltner, 11 Sun Valley Way, Morris Plains, N.J. 07950

Filed Jun. 7, 1976, Ser. No. 693,590

Term of patent 14 years

Int. Cl. D16—*06*

U.S. Cl. D16—83

249,800

SEMI-AUTOMATIC FIREARM

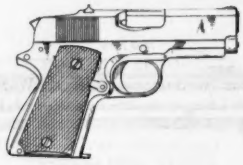
Patrick Yates, 33B Ashworth, China Lake, Calif. 93555; Sidney H. Woodcock, Penthouse Seattle Tower, Seattle, Wash. 98101, and Jeffrey R. Beals, 11216 Phinney Ave. North, Seattle, Wash. 98133

Filed Jun. 3, 1976, Ser. No. 692,568

Term of patent 14 years

Int. Cl. D22—*01*

U.S. Cl. D22—1



249,801

APPARATUS FOR DRAINING AND FLUSHING A LIQUID CHEMICAL FROM A CONTAINER

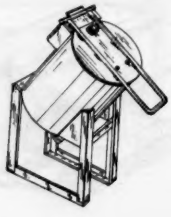
W. Dewell Hollingsworth, Industrial Park Road, Boone, Iowa 50036

Filed Feb. 14, 1977, Ser. No. 768,440

Term of patent 14 years

Int. Cl. D23—*01*

U.S. Cl. D23—03



249,802

TISSUE CULTURE PLATE

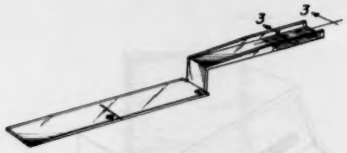
George F. Lyman, Weston, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.

Filed Aug. 11, 1976, Ser. No. 713,421

Term of patent 14 years

Int. Cl. D24—*99*

U.S. Cl. D24—23



249,803

VALVE HANDLE

Aruo Okano, Tokyo, Japan, assignor to Toyo Valve Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1976, Ser. No. 736,153

Claims priority, application Japan, Apr. 28, 1976, 51-15721

Term of patent 14 years

Int. Cl. D23—*01*

U.S. Cl. D23—30

249,804

COUPLING UNIT

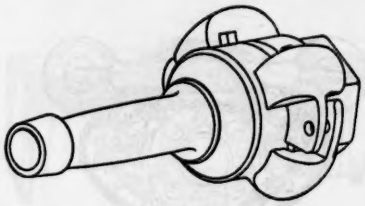
Howard Archibald Treloar, 52 Maitland St., Mitcham, South Australia, Australia (5062)

Division of Ser. No. 672,834, Apr. 1, 1976, Pat. No. Des. 246,855. This application Sep. 21, 1977, Ser. No. 835,292

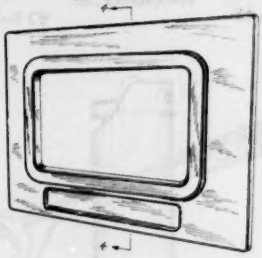
Term of patent 14 years

Int. Cl. D23—*01*

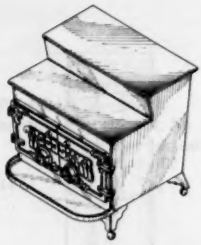
U.S. Cl. D23—43



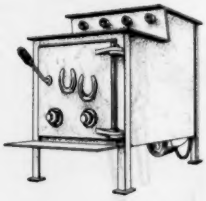
249,805
FRONT FOR BATHING CHAMBER
Donald W. Doman, Janesville, Wis., assignor to Kohler Co.
Filed Dec. 6, 1976, Ser. No. 747,918
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69



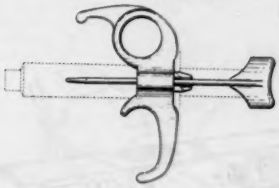
249,806
STOVE
William C. Walker, 3675 S. 2300 East, Salt Lake City, Utah 84109, and William D. Atkinson, 12245 S. 2240 West, Riverton, Utah 84065
Filed Jan. 10, 1977, Ser. No. 757,845
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



249,807
WOOD BURNING STOVE
Robert S. England, 359-A Pine Acre Dr., Madison Heights, Va. 24572
Filed Dec. 16, 1977, Ser. No. 861,429
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

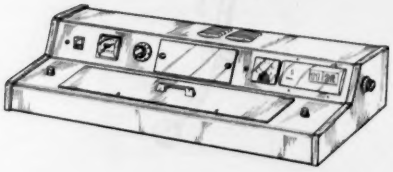


249,808
SYRINGE PUMPING HANDLE
William G. Bloom, Santa Monica, and Gerald W. Schmidt, Northridge, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Dec. 6, 1976, Ser. No. 748,123
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—25

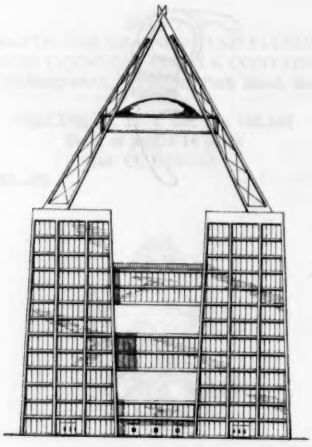


249,809
SYRINGE HANDLE GRIP
William G. Bloom, Northridge, and Gerald W. Schmidt, Santa Monica, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Dec. 6, 1976, Ser. No. 748,045
Term of patent 14 years
Int. Cl. 24—*02*
U.S. Cl. 24—25

249,810
EPILATION APPARATUS
George Holleley, Merseyside, England, assignor to Slimmaster Beauty Equipment (Sales) Limited
Filed Jun. 14, 1976, Ser. No. 695,343
Claims priority, application United Kingdom, Dec. 17, 1975, 973680/75
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—8

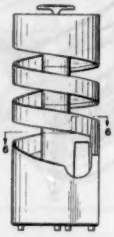


249,811
BUILDING
Billy J. Tucker, 6321 Bucknell Cir., Virginia Beach, Va. 23462
Filed Dec. 17, 1976, Ser. No. 751,903
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—5



249,812
CIGARETTE LIGHTER
Kenjiro Goto, Urawa, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kawaguchi, Japan
Filed Jun. 14, 1976, Ser. No. 695,774
Term of patent 07 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

249,813
BALL THROWER
Ray A. Young, and Craig A. Young, both of Geneva, N.Y., assignors to Omnitec Products Corporation, Chagrin Falls, Ohio
Filed Feb. 23, 1976, Ser. No. 660,046
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 R

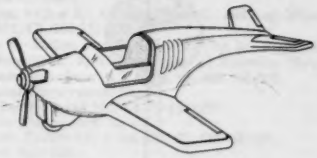


249,814
GOLF GREEN REPAIR TOOL
Murphy Dennis Cudahy, III, South Bend, Ind., assignor to Murphy Products Incorporated, South Bend, Ill.
Filed Jan. 14, 1977, Ser. No. 759,771
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

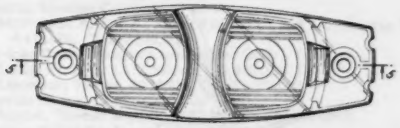
249,815
HAND LAUNCHER FOR CLAY PIGEONS
Urban A. Huelskamp, Dayton, Ohio, assignor to MTM Molded Products Company
Filed Apr. 29, 1976, Ser. No. 681,439
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CP

249,816
SKI HOLDER
John R. Zelle, Fairfield, Conn. 06430
Filed Jun. 17, 1975, Ser. No. 587,689
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D34—14 D

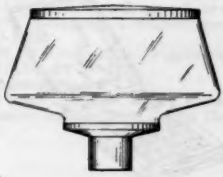
249,817
TOY AIRPLANE
Jeffrey T. Samson, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 29, 1975, Ser. No. 644,427
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



249,818
MARKER LENS
Richard Ball, Toronto, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Canada
Filed Feb. 23, 1977, Ser. No. 771,837
Claims priority, application Canada, Oct. 26, 1976, 0610762
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 A



249,819
ENCLOSURE FOR A LUMINAIRE
James Tatsuo Asaki, Fair Haven, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Aug. 2, 1976, Ser. No. 710,599
Term of patent 14 years
Int. Cl. D26—*03, 05*
U.S. Cl. D48—35

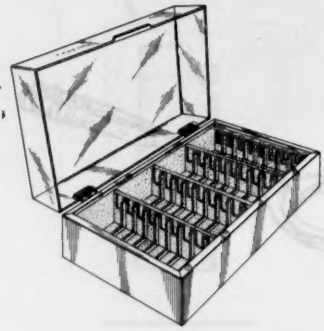


249,820
MUSICAL DRUM BEATER
Forrest W. Clark, Fountain Valley, Calif., assignor to CBS Inc., New York, N.Y.
Filed Aug. 30, 1976, Ser. No. 718,932
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D56—1 E

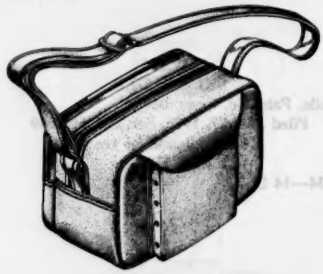
249,821
HOLDER FOR PAINT APPLICATION PAD
Donald R. Cooke, Minneapolis, and Robert I. Janssen, St. Paul, both of Minn., assignors to Padco, Inc., Minneapolis, Minn.
Filed Mar. 21, 1977, Ser. No. 779,813
Term of patent 14 years
Int. Cl. D8—*05;* D7—*05*
U.S. Cl. D64—18

249,822
COMBINED ELECTRONIC CALCULATOR AND CLOCK
Yoshihisa Ohie, and Masafumi Yamagami, both of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 31, 1977, Ser. No. 847,311
Claims priority, application Japan, May 12, 1977, 52-18250
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

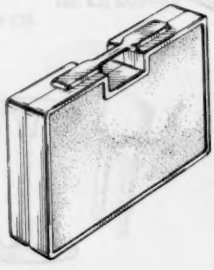
249,823
CASE FOR TAPE CARTRIDGES AND CASSETTES
Joseph L. Berkman, 48 Country Rd., Mamaroneck, N.Y. 10543
Filed Feb. 15, 1974, Ser. No. 442,777
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D



249,824
CAMERA BAG
George Koszegi, 1129 Cambridge Dr., South Bend, Ind. 46614
Filed Feb. 17, 1977, Ser. No. 769,669
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—5 E



249,825
BRIEFCASE
Joseph Hasulak, 2932 N. 2nd St., Phoenix, Ariz. 85012
Filed Mar. 28, 1977, Ser. No. 781,634
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 B



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF OCTOBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & E Plastik Pak Co. Inc.: *See—*
Bennett, J. Richard, 4,117,876, Cl. 160-67.000.

Abbey, Harold G. Variable venturi carburetion system. 4,118,444, Cl. 261-44.00A.

Abbott, Harry Thomas, to Brunswick Corporation. Longitudinal load carrying method for fiber reinforced filament wound structures. 4,118,262, Cl. 156-175.000.

Abdul-Rahman, Yahia A. K.: *See—*
Myers, Gary A.; Abdul-Rahman, Yahia A. K.; and Skinner, James L., 4,118,309, Cl. 208-11.00R.

Abraham, Nedumparambil A.: *See—*
Immer, Hans U.; and Abraham, Nedumparambil A., 4,118,380, Cl. 260-112.50S.

Abromavage, John C.: *See—*
Sage, Howard M.; and Abromavage, John C., 4,117,964, Cl. 224-42.10E.

Achenbach, Gary D.: *See—*
Becker, Donald E.; Achenbach, Gary D.; and Stuever, George W., 4,118,325, Cl. 252-8.100.

ACI Technical Centre Pty Ltd.: *See—*
Erskine, Clive Arnold, 4,118,236, Cl. 106-71.000.

Acuncius, Dennis S.; Herchenroeder, Robert Blanchard; Kirchner, Russell W.; and Silence, William L., to Cabot Corporation. Thermally stable high-temperature nickel-base alloys. 4,118,223, Cl. 75-171.000.

Adam, Robert G. Side loading-rear discharging trailer for multiple round bales. 4,117,940, Cl. 214-1.0HH.

Affouard, Robert. Hydraulic rotary devices. 4,117,768, Cl. 91-499.000.

Agency of Industrial Science & Technology: *See—*
Ishibashi, Katsuji; Mitsui, Shigeo; and Kobayashi, Rikio, 4,118,341, Cl. 252-438.000.
Matsuda, Kiyofumi, 4,118,124, Cl. 356-107.000.

AGFA-Gevaert AG: *See—*
Liermann, Traugott; and Dietrich, Karl-Heinz, 4,118,121, Cl. 355-75.000.

AGFA-Gevaert Aktiengesellschaft: *See—*
Klein, Hans-Joachim; Rupprecht, Manfred; Wonneberg, Heinz; Geiger, Julius; and Masa, Gunter, 4,118,127, Cl. 356-200.000.

Agfa-Gevaert N.V.: *See—*
Corluy, Hans Josephus; Moll, Franz; Muller, Herbert; and Hase, Marie, 4,118,228, Cl. 96-17.000.

Aguilar, Henry. Quick reset timer. 4,117,666, Cl. 58-144.000.

Agway, Inc.: *See—*
Braund, Darwin G.; Dolge, Kendall L.; Goings, Richard L.; and Steele, Robert L., 4,118,513, Cl. 426-2.000.

Air Frohlich AG fur Energie-Ruckgewinnung: *See—*
Frei, Willi, 4,117,884, Cl. 165-175.000.

Aisan Industry Co., Ltd.: *See—*
Minoura, Mikio, 4,117,816, Cl. 123-119.00A.

Aisin Seiki Kabushiki Kaisha: *See—*
Murakami, Noboru; and Furusawa, Choji, 4,117,677, Cl. 60-345.000.

Akagi, Takao: *See—*
Nakagawa, Junyo; Akagi, Takao; and Hiramatsu, Koji, 4,118,529, Cl. 428-91.000.

Akamatu, Keiji, to Roland Corporation. Rectangular waveform signal reproducing circuit for electronic musical instruments. 4,117,757, Cl. 84-1.010.

Akiyama, Chuji: *See—*
Suzuki, Kazuie; Torimaru, Takashi; and Akiyama, Chuji, 4,117,721, Cl. 73-194.0EM.

Aksjeselskapet NORCEM: *See—*
Kjohl, Olav; and Olstad, Paul Henrik, 4,118,242, Cl. 106-98.000.

Aktiebolaget Carl Munters: *See—*
Norback, Per G., 4,118,198, Cl. 422-173.000.

Alexander, Gordon A., to Emhart Industries, Inc. Mortise lock. 4,118,056, Cl. 292-169.170.

Alkire, Gerald R.: *See—*
Calfo, Raymond M.; Dailey, George F.; Alkire, Gerald R.; and Mulach, Arthur, 4,118,645, Cl. 310-53.000.

Allan, John. Rotary piston machine. 4,118,159, Cl. 418-153.000.

Allan Tackle Manufacturing Co., Inc.: *See—*
Rienzo, Donald D., 4,117,965, Cl. 224-48.00R.

Allegre, Jean: *See—*
Gillet, Roger; and Allegre, Jean, 4,118,648, Cl. 310-269.000.

Allen-Bradley Company: *See—*
Casto, Walter V.; DeLong, Lawrence W.; Markley, Theodore J.; and Struger, Odo J., 4,118,789, Cl. 364-900.000.
Struger, Odo J.; McAdams, Timothy E.; and Dummermuth, Ernst, 4,118,792, Cl. 364-900.000.

Allen, David O., to Buckeye Molding Company. Plastic closure. 4,117,950, Cl. 220-306.000.

Allen & Hanburys Limited: *See—*
James, Michael, 4,117,844, Cl. 128-266.000.

Allen, Loy F., to Gulf Oil Corporation. Downhole well pump control system. 4,118,148, Cl. 417-12.000.

Allen, Richard C.: *See—*
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,118,401, Cl. 260-333.000.

Allen, Royce H.; Sutton, Jerry L.; Griffin, Dan M.; Frye, Hal W.; and Colborn, Joseph G., to United States of America, Navy. Digital sound velocity calculator. 4,118,782, Cl. 364-565.000.

Allied Chemical Corporation: *See—*
Tanner, Lee E., 4,118,222, Cl. 75-134.00V.

Allis-Chalmers Corporation: *See—*
Bliemeister, Robert M., 4,118,180, Cl. 432-103.000.

Altek Systems, Inc.: *See—*
Budnick, Lawrence T., 4,118,097, Cl. 339-232.000.

Alvey Inc.: *See—*
Werntz, Charles W., 4,117,923, Cl. 198-790.000.

Amerace Corporation: *See—*
O'Neil, Charles P.; Smorzaniuk, Adam; and Young, James O., 4,118,005, Cl. 251-75.000.

American Color & Chemical Corporation: *See—*
Botros, Raouf, 4,118,383, Cl. 260-156.000.

American Cyanamid Company: *See—*
Casey, Donald James; and Epstein, Martin, 4,118,470, Cl. 424-19.000.
Conrow, Ransom Brown; and Bernstein, Seymour, 4,118,418, Cl. 562-439.000.
Conrow, Ransom Brown; and Bernstein, Seymour, 4,118,585, Cl. 560-44.000.
Epstein, Joseph William, 4,118,417, Cl. 562-401.000.
Fanshawe, William Joseph; Safir, Sidney Robert; and Crawley, Lantz Stephen, 4,118,393, Cl. 260-326.50B.
Lang, Stanley Albert, Jr.; Fabio, Paul Frank; Lin, Yang-I; Murdock, Keith Chadwick; and Fields, Thomas Lynn, 4,118,498, Cl. 424-267.000.
Parekh, Girish Girdhar, 4,118,437, Cl. 260-834.000.

American District Telegraph Corporation: *See—*
Swift, James L., 4,118,098, Cl. 339-263.00R.

American Flange & Manufacturing Co. Inc.: *See—*
Dwinell, Davis B., 4,117,949, Cl. 220-304.000.

American Hoechst Corporation: *See—*
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,118,401, Cl. 260-333.000.

American Home Products Corporation: *See—*
Ledig, Kurt W., 4,118,561, Cl. 542-470.000.
Lippmann, Wilbur, 4,118,493, Cl. 424-258.000.

American Optical Corporation: *See—*
Naylor, Thomas Kipling, 4,117,848, Cl. 128-419.0PT.

American Safety Equipment Corporation: *See—*
Tanaka, Akira, 4,118,067, Cl. 297-379.000.

American Videonetics: *See—*
Arnstein, Walter, 4,118,738, Cl. 358-148.000.

Amick, James L. Wind-powered car. 4,117,900, Cl. 180-7.00R.

Aminkemi Aktiebolag: *See—*
Eriksson, Jan-Christer; Larsson, Rolf; Rosengren, Ake; and Hjelte, Maj-Britt, 4,118,485, Cl. 424-183.000.

Amort, Jurgen; and Nestler, Heinz, to Dynamit Nobel Aktiengesellschaft. Use of silanes having capped functional groups as adhesivizing agents. 4,118,540, Cl. 428-447.000.

AMP Incorporated: *See—*
Leidy, James Albert; and Porta, Gary Douglas, 4,118,103, Cl. 339-98.000.

Andersen, Lars Q.: *See—*
Neal, Brian; and Andersen, Lars Q., 4,117,671, Cl. 60-262.000.

Anderson, James R., to Central Sprinkler Corporation. Sprinkler head flange assembly. 4,117,887, Cl. 169-37.000.

Anderson, Mark C.: *See—*
Fritsch, Thomas R.; and Anderson, Mark C., 4,118,429, Cl. 260-674.0SA.

Anderson, Martin; and Brinnand, Antony G., to Shell Oil Company. Insecticidal 2-(1-(halobenzoyl)-1-hydroxyiminomethyl)-5,6-dihydro-4H-1,3-thiazines. 4,118,489, Cl. 424-246.000.

Anderson, Raymond H.; and Lewer, Gregory S., to Minnesota Mining and Manufacturing Company. Low-glare overhead projector. 4,118,114, Cl. 353-38.000.

Anderson, Rogers H., to Honeywell Inc. Preparation of high strength halide bodies. 4,118,448, Cl. 264-1.000.

Andonov, Blagoy Alexandrov: *See—*
Petrov, Georgi Mitev; Andonov, Blagoy Alexandrov; Trayanov, Svetozar Paissiev; and Georgiev, Georgi Dimitrov, 4,117,654, Cl. 57-19.000.

Androulakis, John G., to Frigitemp Corporation. Internal insulation for liquefied gas tank. 4,117,947, Cl. 220-435.000.

Anno, James N.: *See—*
Fawcett, Sherwood L.; and Anno, James N., 4,117,696, Cl. 62-115.000.

Anthony Company: *See—*
Mustered, Lyle V., 4,117,901, Cl. 180-51.000.
Mustered, Lyle V., 4,117,905, Cl. 180-139.000.
Mustered, Lyle V., 4,117,906, Cl. 180-139.000.

Apostolatos, George Nikolas; Bohrer, James Calvin; and Inamorato, Jack Thomas, to Colgate-Palmolive Company. Synergistic antibacterial composition containing mixtures of certain halogenated diphenyl ethers and trichlorocarbanilides. 4,118,332, Cl. 252-107.000.

Apple, Martin A.; and Formica, Joseph V., to University of California, The Regents of the. Process for treating neoplastic disease with azetomicins. 4,118,482, Cl. 424-177.000.

Arakawa, Kunihiko: *See—*
Matsui, Takeshi; and Arakawa, Kunihiko, 4,118,438, Cl. 260-857.00L.

Arbuckle, James A., to Textron Inc. Guide bar mount for chain saw. 4,117,594, Cl. 30-381.000.

Arend, Gunter: *See—*
Lindner, Christian; Suling, Carlhans; Arend, Gunter; Brokmeier, Dieter; and Nischk, Gunther, 4,118,375, Cl. 526-240.000.

Argus Chemical Corporation: *See—*
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,118,369, Cl. 260-45.80N.

Argyle, Bernell Edwin; Dekker, Pieter; and Slonczewski, John Casimir, to International Business Machines Corporation. Gradientless propulsion of magnetic bubble domains using modulated in-plane fields. 4,118,793, Cl. 365-30.000.

Arita, Youji, to Mitsubishi Light Metal Industries Limited. Electrolytic alumina reduction cell with heat radiation reducing means. 4,118,304, Cl. 204-243.00R.

Armstrong Cork Company: *See—*
Eckert, Lewis W.; Nikolaus, Harold W.; and Ollinger, James C., 4,117,642, Cl. 52-486.000.
Hager, Nathaniel E., Jr., 4,117,712, Cl. 73-15.00A.

Arnaud, Maurice, to Societe Lignes Telegraphiques et Telephoniques. Long distance coaxial cable with optical fibres. 4,118,594, Cl. 350-96.230.

Arnold, Milton Phillip: *See—*
Pan, Jing Jong; Arnold, Milton Phillip; and Barton, James Castle, 4,118,270, Cl. 156-659.000.

Arnoux, Daniel, to Societe Chauvin Arnoux. Analog multiplier error corrector, notably for precision wattmeters. 4,118,787, Cl. 364-842.000.

Arnstein, Walter, to American Videonetics. Time base error corrector. 4,118,738, Cl. 358-148.000.

Asada, Chiaki; Kusaka, Katsushi; and Kajima, Hisashi, to Foundation: The Research Institute For Special Inorganic Materials, The. Chromium base alloy composite materials reinforced with continuous silicon carbide fibers and a method for producing the same. 4,117,565, Cl. 75-204.000.

Asahi Glass Company Ltd.: *See—*
Takabatake, Mitsuo, 4,118,240, Cl. 106-73.330.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Morishita, Masataka; Yokokawa, Yasuo; Nishikawa, Tokio; Mishiro, Masahiro; Ohashi, Shigeyasu; Fukushima, Mitsuru; Inaba, Yoshihito; and Matsuda, Tetsuo, 4,118,336, Cl. 252-316.000.
Seko, Maomi; Miyake, Tetsuya; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, 4,118,457, Cl. 423-7.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Masahiro, 4,118,712, Cl. 354-23.00D.
Kurei, Hiroshi; and Shono, Tetsuji, 4,118,725, Cl. 354-289.000.

Ascani, Leonard A., Jr.: *See—*
Hamilton, C. Howard; and Ascani, Leonard A., Jr., 4,117,970, Cl. 228-173.00A.

Ashida, Itaru: *See—*
Suzuki, Tetsuro; Oishi, Masaaki; and Ashida, Itaru, 4,117,743, Cl. 74-577.00M.

Asko, Inc.: *See—*
Dempsey, Martin J., 4,117,705, Cl. 72-237.000.

Asselin, Andre A.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,118,394, Cl. 260-326.280.

Atencio, Francisco Jose Gutierrez. Incorporable hydromotive assembly. 4,117,676, Cl. 60-327.000.

Atkinson, Thomas Carl; and Fay, Clifford C., to Rohr Industries, Inc. Vehicle seat assembly. 4,118,061, Cl. 296-63.000.

Atlanta Metal Products, Inc.: *See—*
Kidd, James M., Jr.; and Woods, Jay G., 4,117,638, Cl. 52-200.000.

Atlantic Richfield Company: *See—*
Mooi, John, 4,118,430, Cl. 260-668.00A.
Myers, Gary A.; Abdul-Rahman, Yahia A. K.; and Skinner, James L., 4,118,309, Cl. 208-11.00R.

Atsuchi, Toru. Automobile headlights. 4,118,765, Cl. 362-384.000.

Au Coin, Thomas R.; Di Vita, Sam; and Wade, Melvin J., to United States of America, Army. Method of maintaining the strength of optical fibers. 4,118,211, Cl. 65-3.00R.

Audi Nsu Auto Union Aktiengesellschaft: *See—*
Lechler, Rolf, 4,117,907, Cl. 184-6.200.

Audio Developments International: *See—*
Yeap, Arthur K. C., 4,118,601, Cl. 179-1.00D.

Auer, John H., Jr.; and Sibley, Henry C., to General Signal Corporation. Vital relay operating circuit. 4,118,750, Cl. 361-182.000.

Auerbach, Andrew B.: *See—*
Turbak, Albin F.; Thelman, John P.; and Auerbach, Andrew B., 4,118,350, Cl. 260-15.000.

Aulich, Hubert; and Grabmaier, Josef, to Siemens Aktiengesellschaft. Double crucible system for the production of light conducting fibers. 4,118,212, Cl. 65-3.00A.

Austin, Robert R.; and Moen, A. M. D., to International Telephone and Telegraph Corporation. Fluid sampling system. 4,117,725, Cl. 73-421.50R.

Automatech Industries, Inc.: *See—*
Rovin, Herman; Levine, Lawrence J.; Opuszenski, Theodore; Pellicano, Joseph; and Swenson, Alan F., 4,117,789, Cl. 112-181.000.

Automatic Industrial Machines, Inc.: *See—*
Boettcher, Carl E., 4,118,264, Cl. 156-238.000.

Automotive Products Limited: *See—*
Windsor, Harry Mellows, 4,117,747, Cl. 74-866.000.

Avery Products Corporation: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,118,442, Cl. 260-885.000.

Ayerst, McKenna & Harrison Limited: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,118,394, Cl. 260-326.280.
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,118,511, Cl. 424-330.000.
Immer, Hans U.; and Abraham, Nedumparambil A., 4,118,380, Cl. 260-112.50S.
Lippmann, Wilbur, 4,118,495, Cl. 424-258.000.

B. Heller & Company: *See—*
Juhn, Hyunil; and Wistreich, Hugo E., 4,118,519, Cl. 426-533.000.

Babiec, John S., Jr.: *See—*
Goldstein, Stephen L.; and Babiec, John S., Jr., 4,118,586, Cl. 568-767.000.

Bach, Hartwig C.: *See—*
Silver, Frank M.; and Bach, Hartwig C., 4,118,358, Cl. 260-30.80R.

Baer, Karl: *See—*
Fouquet, Gerd; Merger, Franz; Platz, Rolf; and Baer, Karl, 4,118,588, Cl. 560-210.000.

Bahr, Hermann: *See—*
Lattrell, Rudolf; Kief, Heinrich; and Bahr, Hermann, 4,118,509, Cl. 424-295.000.

Bair, Frank E.: *See—*
Ruffner, Frederick G.; and Bair, Frank E., 4,118,120, Cl. 355-75.000.

Baker, Peter Frederick, to Quinton Hazell Limited. Bearing carrier for a clutch release bearing. 4,117,916, Cl. 192-98.000.

Bakken, George S., to United States of America, Energy. System for the production of plasma. 4,118,274, Cl. 176-1.000.

Bala, Harry: *See—*
Mowli, John C.; and Bala, Harry, 4,117,934, Cl. 206-610.000.

Baldwin, Colin: *See—*
Bingham, Kenneth Charles Arthur; Gillingham, Alan George Albert; and Baldwin, Colin, 4,118,523, Cl. 427-97.000.

Ball Corporation: *See—*
Scholes, Addison B., 4,118,202, Cl. 44-6.000.

Ball, Edward R., to GTE Automatic Electric Laboratories, Incorporated. Phase locked loop including active lowpass filter. 4,118,674, Cl. 331-17.000.

Ball, Kenneth, to Vickers-Intertek Limited. Apparatus for working under water. 4,117,688, Cl. 405-188.000.

Balland, Jean, to Manufacture de Produits Chimiques Protex, Societe Anonyme. Fabric-printing or dyeing process using thermosensitizer for latex binder. 4,118,538, Cl. 428-425.000.

Ballas, George C.: *See—*
Campbell, David Lester, 4,118,000, Cl. 248-228.000.

Ballinger, Dale O., to Honeywell Inc. Material processor with relative movement between material and its positioner. 4,118,179, Cl. 432-59.000.

Ban, Itsuki; Iizuka, Shohei; and Funakoshi, Hisashi. Cassette tape recorder with memory controlled selective by-pass. 4,118,743, Cl. 360-73.000.

Banko, Anton, to Surgical Design Corp. Surgical operating system with upper pressure limit. 4,117,843, Cl. 128-230.000.

Bansal, Jag M.; and Kumar, Anil. Gangable radiant energy collector. 4,117,830, Cl. 126-271.000.

Bansal, Jag M.; and Kumar, Anil, to Bansal, Manju. Energy collector for collecting solar energy and the like. 4,117,831, Cl. 126-271.000.

Bansal, Manju: *See—*
Bansal, Jag M.; and Kumar, Anil, 4,117,831, Cl. 126-271.000.

Banucci, Eugene G.; and Boldebuck, Edith M., to General Electric Company. Novel polyetheramide-imide epoxy resin blends. 4,118,535, Cl. 428-383.000.

Barben, Theodore R., II, to Thomas-Barben Instruments. Four electrode conductivity sensor. 4,118,663, Cl. 324-30.00R.

Barbery, Gilles; and Cecile, Jean-Luc, to Bureau de Recherches Geologiques et Minieres. Process for the concentration by flotation of fine mesh size or oxidized ores of copper, lead, zinc. 4,118,312, Cl. 209-166.000.

Barisoni, Mario; Barteri, Massimo; Ricci-Bitti, Roberto; Marianeschi, Edmondo G. A.; Basevi, Sandro C.; Borgianni, Carlo; and Santafe, Carlo, to Centro Sperimentale Metallurgico S.p.A; and Terni Societa per l'Industria e'Elettricita S.p.A. Process for the production of a

silicon steel strip with high magnetic characteristics. 4,118,255, Cl. 148-111.000.

Barkan, Philip; and Imam, Imdad, to General Electric Company. Hydraulically-actuated operating system for an electric circuit breaker. 4,118,613, Cl. 200-82.00B.

Barnard, Daniel D., to Bendix Corporation, The. Fuel injection cut off means for over temperature protection of exhaust treatment device. 4,117,807, Cl. 123-32.0EE.

Barrett, Joseph F.; and Kiscaden, Roy W., to Westinghouse Electric Corp. Synchronization system for a combined cycle electric power plant. 4,118,635, Cl. 290-40.00R.

Barrientos, Christine Ann. Plate holder. 4,118,081, Cl. 312-8.000.

Barry, Louis T.: *See—*
von Dreusche, Charles F., Jr.; and Barry, Louis T., 4,118,220, Cl. 75-69.000.

Barteri, Massimo: *See—*
Barisoni, Mario; Barteri, Massimo; Ricci-Bitti, Roberto; Marianeschi, Edmondo G. A.; Basevi, Sandro C.; Borgianni, Carlo; and Santafe, Carlo, 4,118,255, Cl. 148-111.000.

Bartlett, Robert N. Apparatus for connecting a vacuum cleaner and solution tank as a cleaning solution-extraction cleaner. 4,118,002, Cl. 248-311.10R.

Barto, Robert M., Jr., to Universal Photocopy, Inc. Electrostatic copier machine with selectable magnification ratios. 4,118,118, Cl. 355-8.000.

Barton, James Castle: *See—*
Pan, Jing Jong; Arnold, Milton Phillip; and Barton, James Castle, 4,118,270, Cl. 156-659.000.

Bartrum, David Edward, to BF Goodrich Company, The. Extrusion apparatus. 4,118,166, Cl. 425-462.000.

Basevi, Sandro C.: *See—*
Barisoni, Mario; Barteri, Massimo; Ricci-Bitti, Roberto; Marianeschi, Edmondo G. A.; Basevi, Sandro C.; Borgianni, Carlo; and Santafe, Carlo, 4,118,255, Cl. 148-111.000.

BASF Aktiengesellschaft: *See—*
Fouquet, Gerd; Merger, Franz; Platz, Rolf; and Baer, Karl, 4,118,588, Cl. 560-210.000.
Wittkamp, Heinrich; and Gehrung, Manfred, 4,118,616, Cl. 206-387.000.

BASF Farben & Fasern AG: *See—*
Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, 4,118,366, Cl. 260-40.00R.

BASF Wyandotte Corporation: *See—*
Login, Robert B., 4,118,326, Cl. 252-8.600.

Bassett, Henry C.; From, Charles A., Jr.; Parker, John F.; and Worley, Ansel A., to Western Electric Company, Inc. Connector with perforable insulative liner and methods of fabricating same. 4,118,596, Cl. 174-87.000.

Battelle Development Corporation: *See—*
Fawcett, Sherwood L.; and Anno, James N., 4,117,696, Cl. 62-115.000.
Gross, Daniel; and Genequand, Pierre, 4,117,829, Cl. 126-270.000.
Noir, Dominique; and Meier, John, 4,118,172, Cl. 431-12.000.

Battigelli, Jean A.: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,118,213, Cl. 65-5.000.

Baudet, Pierre; Ricard, Jean-Paul; and Schulthess, Adrian, to Laboratories om Societe Anonyme. Mixed esters of polyols. 4,118,583, Cl. 560-63.000.

Baudin, Lucien, to Idram Engineering Company Est. Rotary machine with controlled retractable pivoted members such as blades or pistons. 4,118,160, Cl. 418-260.000.

Bauer, James J.: *See—*
Beckstrom, Harold K.; Bauer, James J.; Morehouse, James O.; and Loraas, Orlan J., 4,117,944, Cl. 214-131.00A.
Henline, John W.; Bauer, James J.; and Morehouse, James O., 4,117,902, Cl. 180-54.00R.

Baumgarten, Wilfried, to Paul Troester Maschinenfabrik. Apparatus for manufacturing lengths of rubber hose of curved shape. 4,118,162, Cl. 425-113.000.

Baumgartner, Erich Rudolf; and Doehler, Peter. Smoothing or pressing iron. 4,117,612, Cl. 38-91.000.

Baurecht, Heinz-Ewald; Hornle, Reinhold; and Muller, Gerd, to Bayer Aktiengesellschaft. Process for the preparation of copper phthalocyanine. 4,118,391, Cl. 260-314.500.

Bausch & Lomb Incorporated: *See—*
Dey, Thomas W., 4,118,761, Cl. 362-297.000.

Bay, William P. Helmet shield and visor apparatus. 4,117,553, Cl. 2-10.000.

Bayer Aktiengesellschaft: *See—*
Baurecht, Heinz-Ewald; Hornle, Reinhold; and Muller, Gerd, 4,118,391, Cl. 260-314.500.
Jager, Horst; and Dehmel, Georg, 4,118,382, Cl. 260-154.000.
Kleinstuck, Roland; and Block, Hans-Dieter, 4,118,435, Cl. 260-972.000.
Konig, Joachim; and Suling, Carlhans, 4,118,556, Cl. 526-229.000.
Lindner, Christian; Suling, Carlhans; Arend, Gunter; Brokmeier, Dieter; and Nischk, Gunther, 4,118,375, Cl. 526-240.000.
Maurer, Fritz; Riebel, Hans-Jochem; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,118,486, Cl. 424-212.000.
Molls, Hans-Heinz; Schiwy, Willy; Hornle, Reinhold; and Nebeling, Reinhard, 4,118,384, Cl. 260-163.000.
Nielinger, Werner; Brassat, Bert; and Vernaleken, Hugo, 4,118,364, Cl. 260-37.00N.
Pedain, Josef; Wellner, Wolfgang; Gruber, Hermann; and Dietrich, Manfred, 4,118,376, Cl. 528-59.000.
Regel, Erik; Draber, Wilfried; Buchel, Karl Heinz; and Plempel, Manfred, 4,118,487, Cl. 424-232.000.
Schnabel, Eugen; Schlumberger, Horst Dieter; Reinhardt, Gerd; Truscheit, Ernst; and Tschesche, Harald, 4,118,481, Cl. 424-177.000.

Bayerische Motoren Werke AG: *See—*
Marwitz, Hans-Gunther v.d., 4,118,073, Cl. 301-6.0CS.

BBC Brown, Boveri & Company Limited: *See—*
Kupfer, Theo, 4,118,133, Cl. 403-24.000.

Beach, Janet. Medical apparatus for transporting fluids. 4,118,195, Cl. 222-215.000.

Beall, George H.; Chyung, Kenneth; and Hoda, Syed N., to Corning Glass Works. Glass-ceramics displaying inherent lubricity. 4,118,237, Cl. 106-39.600.

Beardmore, James W.; and Goehring, Daniel, to Shell Oil Company. Wax composition. 4,118,203, Cl. 44-7.500.

Beardsley, James L.; and Zollinger, J. Lamar, to Minnesota Mining and Manufacturing Company. Silane-terminated polycarbodiimide primers and composite coatings therefrom. 4,118,536, Cl. 428-413.000.

Beck, Earl A. Air over oil high pressure modulating valve. 4,117,865, Cl. 137-627.500.

Beck, James Richard; and Gajewski, Robert Peter, to Eli Lilly and Company. Herbicidal 1,4-diphenyl-3-pyrazolin-5-ones. 4,118,574, Cl. 548-363.000.

Becker, Donald E.; Achenbach, Gary D.; and Stuever, George W., to Continental Oil Company. Fireproofing composition. 4,118,325, Cl. 252-8.100.

Becker, Manfred. Analog-to-digital converter recalibration method and apparatus. 4,118,698, Cl. 340-347.0CC.

Beckman Instruments, Inc.: *See—*
Neti, Radhakrishna Murty; and Sawa, Kenneth Bruno, 4,118,193, Cl. 422-94.000.

Beckstrom, Harold K.; Bauer, James J.; Morehouse, James O.; and Loraas, Orlan J., to Clark Equipment Company. Backhoe mounting assembly. 4,117,944, Cl. 214-131.00A.

Bedford Engineering Corp.: *See—*
Richardson, Carl; Stoddart, Hugh F.; and Wiley, Philip A., 4,117,935, Cl. 209-586.000.

Bedford Industries, Inc.: *See—*
Moore, Doyle A., 4,117,988, Cl. 242-71.900.

Begin, Louis E.: *See—*
Dunbar, Joseph E.; and Begin, Louis E., 4,118,564, Cl. 544-82.000.

Behrenz, Wolfgang: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,118,486, Cl. 424-212.000.

Behringwerke Aktiengesellschaft: *See—*
Bonacker, Ludwig; and Stark, Josef, 4,118,349, Cl. 260-8.000.
Schmidtberger, Rudolf, 4,118,379, Cl. 260-112.00B.

Belden Corporation: *See—*
Medcraft, Wayne R., 4,117,711, Cl. 72-413.000.

Bell Telephone Laboratories, Incorporated: *See—*
Berglund, Richard Newman; and Pasternak, John Paul, 4,118,095, Cl. 339-99.00R.
Chang, Kuang-Chou; Heller, Adam; and Miller, Barry, 4,118,548, Cl. 429-111.000.
Dombkowsi, Walter Stephen; and Rosin, Erwin August, 4,117,670, Cl. 60-39.28T.
Pfahnl, Arnold; and Schuller, Joris Maarten, 4,118,595, Cl. 174-68.500.
Roberts, Charles Sheldon, 4,118,788, Cl. 364-900.000.
Smith, Arnold Ray, 4,117,585, Cl. 29-566.300.

Belmore, Richard J. Rotatable refrigerated valve. 4,117,694, Cl. 62-55.500.

Beloit Corporation: *See—*
Sokolow, Nickolas N., 4,117,955, Cl. 222-144.500.

Bendix Corporation, The: *See—*
Barnard, Daniel D., 4,117,807, Cl. 123-32.0EE.
Carre, Jean-Jacques; and Levrai, Roland, 4,117,769, Cl. 91-170.00R.
Johannesen, Donald D., 4,117,910, Cl. 188-71.900.
Mayer, Endre A., 4,118,157, Cl. 418-1.000.
Ruppe, Joseph P., Jr., 4,117,912, Cl. 188-216.000.
Summers, Robert Milton, 4,118,346, Cl. 260-2.300.
Taig, Alistair Gordon, 4,117,864, Cl. 137-625.230.

Benedyk, Joseph C.; and Stratton, Richard O., to Brunswick Corporation. Pile product molded of ethylene/vinyl acetate copolymer. 4,118,530, Cl. 428-92.000.

Bengsch, Peter; and Bjornstad, Steinar, to Bengsch, Peter. Folding clothes-hanger. 4,117,960, Cl. 223-94.000.

Bennett, J. Richard, to A & E Plastik Pak Co. Inc. Awning for a mobile home. 4,117,876, Cl. 160-67.000.

Bennett, James G.; Cooper, Glenn D.; and Katchman, Arthur, to General Electric Company. Method for preparing blends of rubber, a polyphenylene ether resin and an alkenyl aromatic addition polymer. 4,118,348, Cl. 260-4.0AR.

Benthos Incorporated: *See—*
Hayward, Gary G., 4,117,718, Cl. 73-52.000.

Berchielli, Aldo S.: *See—*
Chireau, Roland F.; and Berchielli, Aldo S., 4,118,552, Cl. 429-219.000.

Berenguer, Antonio Subiros. Portable article carrier. 4,117,874, Cl. 150-1.700.

Berges, David A., to SmithKline Corporation. 7-Acyl-3-(sulfonic acid and sulfamoyl substituted tetrazolyl thiomethyl)cephalosporins and pharmaceutical compositions containing them. 4,118,490, Cl. 424-246.000.

Berges, David A., to SmithKline Corporation. 7-Acyl-3-(sulfaminoal-

kyl substituted tetrazolylthiomethyl)cephalosporins, antibacterial compositions containing them and methods of treating bacterial infections with them. 4,118,491, Cl. 424-246.000.
Berglund, Richard Newman; and Pasternak, John Paul, to Bell Telephone Laboratories, Incorporated. Wire connecting block. 4,118,095, Cl. 339-99.00R.
Bergmann, Udo: *See*—
Stromberger-D'Alton-Rauch, Ilse-Dore; Klose, Karl; Bergmann, Udo; Glattli, Alfred; and Hodum, Claus-Peter, 4,118,229, Cl. 96-27.00H.
Berkman, Joseph L. Case for differently sized magnetic tape enclosures. 4,117,931, Cl. 206-387.000.
Berkowitz, Sidney, to FMC Corporation. Chloroisocyanurate compounds. 4,118,569, Cl. 544-190.000.
Bernett, Frank E., to Tile Council of America, Inc. Mortar compositions and method of making same. 4,118,241, Cl. 106-90.000.
Bernstein, Albert J., to United States of America, National Aeronautics and Space Administration. Automatic communication signal monitoring system. 4,118,666, Cl. 324-77.00C.
Bernstein, Seymour: *See*—
Conrow, Ransom Brown; and Bernstein, Seymour, 4,118,418, Cl. 562-439.000.
Conrow, Ransom Brown; and Bernstein, Seymour, 4,118,585, Cl. 560-44.000.
Bernt, Erich: *See*—
Determann, Helmut; Bernt, Erich; Dollacker, Werner; Gutmann, Ingeborg, deceased; and Engelhardt, Gudrun, administrator, 4,118,279, Cl. 195-63.000.
Berry, Clifford W.: *See*—
Larsen, Ronald L.; and Berry, Clifford W., 4,117,932, Cl. 206-419.000.
Berry, Robert, to Fairchild Camera and Instrument Corporation. Integrated circuit structures utilizing conductive buried regions. 4,118,728, Cl. 357-22.000.
Berube, Richard R.: *See*—
Marchetti, Francis R.; Zentz, William E.; and Berube, Richard R., 4,118,247, Cl. 106-308.00N.
Besse, Celestine Paul, to Chevron Research Company. Compliant offshore structure. 4,117,690, Cl. 405-227.000.
Bestmann, Hans Jurgen; Stransky, Werner Theo; and Vostrowsky, Otto, to Hoechst Aktiengesellschaft. Process for preparing cis-olefins. 4,118,406, Cl. 260-410.90R.
Bette, Joseph A. Wood burning stove. 4,117,826, Cl. 126-65.000.
Betush, Frank A., to Progressive Machine Products, Inc. Control and selector unit for dental handpieces. 4,117,861, Cl. 137-595.000.
Betz Laboratories, Inc.: *See*—
Vorchheimer, Norman, 4,118,355, Cl. 260-29.6PT.
BF Goodrich Company, The: *See*—
Bartrum, David Edward, 4,118,166, Cl. 425-462.000.
Bhabra, Avtar S.: *See*—
Purssell, Robert F.; Bhabra, Avtar S.; and Rossi, Guglielmo, 4,118,610, Cl. 200-67.0DA.
Bhat, Sujata Vasudev; de Souza, Noel John; Dornauer, Horst; Bhattacharya, Bani Kanta; and Dohadwalla, Alihussein Nomanbhai, to Hoechst Aktiengesellschaft. Pharmacologically effective substance from plants belonging to the family of Labiatae. 4,118,508, Cl. 424-283.000.
Bhattacharya, Bani Kanta: *See*—
Bhat, Sujata Vasudev; de Souza, Noel John; Dornauer, Horst; Bhattacharya, Bani Kanta; and Dohadwalla, Alihussein Nomanbhai, 4,118,508, Cl. 424-283.000.
Bhattacharyya, Ajay: *See*—
Carleton, Richard D.; and Bhattacharyya, Ajay, 4,118,275, Cl. 176-36.00R.
Biasoli, Giovanni: *See*—
Giraldi, PierNicola; Nannini, Giuliano; Logemann, Willy; Tommasini, Raffaele; Buttinoni, Ada; and Biasoli, Giovanni, 4,118,504, Cl. 424-274.000.
Bickford, Edgar, to Raymond Lee Organization, Inc., The. Adjustable picture frames. 4,117,614, Cl. 40-155.000.
Bielomatik Leuze & Co.: *See*—
Maus, Dieter; and Buck, Hermann, 4,117,800, Cl. 118-7.000.
Bienert, Horst; and Jardin, Hans, to Webasto-Werk W. Baier GmbH & Co. Vehicle top with pivotable cover. 4,118,063, Cl. 296-137.00½.
Billmeyer, Thomas F., to Preway Inc. Fireplace construction. 4,117,827, Cl. 126-121.000.
Binder, Hans, to Siemens Aktiengesellschaft. Process for adjusting exposure masks relative to a substrate wafer. 4,118,230, Cl. 96-27.00R.
Bingham, Kenneth Charles Arthur; Gillingham, Alan George Albert; and Baldwin, Colin, to International Computers Limited. Production of semiconductor devices. 4,118,523, Cl. 427-97.000.
Bingle, Gerald L.; and Earsley, Melvin L., to Federal-Mogul Corporation. Welded plastic bearing cage and method of making same. 4,118,259, Cl. 156-73.100.
Bischoff, Robert F., Jr. Turning mechanism. 4,118,055, Cl. 292-165.000.
Bittler, Dieter: *See*—
Philippson, Rainer; Krieger, Bernhard; Casals-Stenzel, Jorge; Kerb, Ulrich; Losert, Wolfgang; Prezewowsky, Klaus; Wiechert, Rudolf; and Bittler, Dieter, 4,118,488, Cl. 424-238.000.
Bjornstad, Steinar: *See*—
Bengsch, Peter; and Bjornstad, Steinar, 4,117,960, Cl. 223-94.000.
Blair, Robert W.: *See*—
Mayer, Peter; Blair, Robert W.; and Zamin, Mohammed, 4,118,301, Cl. 204-202.000.
Blanding, Wendell S.; and Van Dewoestine, Robert V., to Corning Glass Works. Extrusion die. 4,118,456, Cl. 264-177.00R.
Bleiweiss, Arthur F.; Crompton, Kenneth J.; and Urbanek, Karel, to Dominion Auto Accessories Limited. Lamp assembly. 4,118,764, Cl. 362-369.000.
Bliemeister, Robert M., to Allis-Chalmers Corporation. Rotary kiln service stands. 4,118,180, Cl. 432-103.000.
Block, Hans-Dieter: *See*—
Kleinstuck, Roland; and Block, Hans-Dieter, 4,118,435, Cl. 260-972.000.
Bodig, Bernd; Schmied, Helmut; and Hohné, Gerd, to Robert Bosch GmbH. Ignition system for internal combustion engines with tapped ignition coil. 4,117,818, Cl. 123-148.00E.
Boehringer Mannheim GmbH: *See*—
Determann, Helmut; Bernt, Erich; Dollacker, Werner; Gutmann, Ingeborg, deceased; and Engelhardt, Gudrun, administrator, 4,118,279, Cl. 195-63.000.
Boeing Company, The: *See*—
Foster, Gene B., 4,117,702, Cl. 72-7.000.
Neal, Brian; and Andersen, Lars Q., 4,117,671, Cl. 60-262.000.
Boettcher, Bodo. Heat recoverable article. 4,118,260, Cl. 156-85.000.
Boettcher, Carl E., to Automatic Industrial Machines, Inc. Method for dry printing on contoured workpieces. 4,118,264, Cl. 156-238.000.
Bogdanoff, Anatoly: *See*—
Porter, Gary D.; and Bogdanoff, Anatoly, 4,118,627, Cl. 250-397.000.
Bogen, Jan O., to Sala International AB. Device for tanks of circular type such as, for example, thickeners, sludge tanks, mixing tanks and the like. 4,118,321, Cl. 210-91.000.
Bohm, Gerhard; and Mayer, Rolf. Hollow body and method of making the same. 4,117,866, Cl. 138-30.000.
Bohm, Peter Wolfgang: *See*—
Weber, Paul; Lankes, Erich; Butschko, Gerhard; Ritzmann, Horst; and Bohm, Peter Wolfgang, 4,118,177, Cl. 432-14.000.
Bohnensieker, Franz. Gas sterilization apparatus. 4,118,191, Cl. 55-279.000.
Bohrer, James Calvin: *See*—
Apostolatos, George Nikolas; Bohrer, James Calvin; and Inamorato, Jack Thomas, 4,118,332, Cl. 252-107.000.
Bold, Eugene W. Calculating devices. 4,117,973, Cl. 235-61.00B.
Boldebuck, Edith M.: *See*—
Banucci, Eugene G.; and Boldebuck, Edith M., 4,118,535, Cl. 428-383.000.
Bolling, Donald Louis: *See*—
Power, George Edward; and Bolling, Donald Louis, 4,118,541, Cl. 428-452.000.
Bolme, Donald W. Removal of nitrogen oxides from industrial gases by use of oxidizing solutions in which nitrates are the oxidants. 4,118,460, Cl. 423-235.000.
Boltad, Arne Martin: *See*—
McCleskey, Robert W., Jr.; Putnam, Paul S.; and Boltad, Arne Martin, 4,117,941, Cl. 214-2.500.
Bonacker, Ludwig; and Stark, Josef, to Behringwerke Aktiengesellschaft. Process for the manufacture of polystyrene latex compounds. 4,118,349, Cl. 260-8.000.
Boomgaard, Dirk J.: *See*—
Shoupp, William E.; Bratkowski, Walter V.; and Boomgaard, Dirk J., 4,118,717, Cl. 354-43.000.
Booth, Rex, to United States of America, Energy. Air bearing vacuum seal assembly. 4,118,042, Cl. 277-226.000.
Borelly, Wolfgang. Apparatus for producing parallel wire strands for bridges and the like by winding and unwinding strand of large cross-section and for simultaneously applying corrosion protection thereto. 4,117,582, Cl. 29-419.00R.
Borg-Warner Corporation: *See*—
Silberschlag, Russell Earl, 4,117,918, Cl. 192-103.00B.
Borgianni, Carlo: *See*—
Barisoni, Mario; Barteri, Massimo; Ricci-Bitti, Roberto; Marianeschi, Edmondo G. A.; Basevi, Sandro C.; Borgianni, Carlo; and Santafe, Carlo, 4,118,255, Cl. 148-111.000.
Bormann, Dieter; Merkel, Wulf; and Muschaweck, Roman, to Hoechst Aktiengesellschaft. Derivatives of 5-aminobenzoic acid having a heterocyclic substituent in the 3-position. 4,118,397, Cl. 260-326.410.
Borona, Russell T., to Westinghouse Electric Corp. Circuit interrupter. 4,118,680, Cl. 335-176.000.
Borroni, Andrea, to Industrie Pirelli Societa per Azioni. Process for manufacturing multi-core electric power cables and cables so-produced. 4,118,593, Cl. 174-26.00R.
Botros, Raouf, to American Color & Chemical Corporation. Azo dyes containing an N-2-pyridine-2,4-dihydroxybenzamide coupler component. 4,118,383, Cl. 260-156.000.
Bouchet-Lassale S.A.: *See*—
Mathys, Pierre, 4,117,664, Cl. 58-86.000.
Bourassa, Richard Lawrence. Combination air filter and air treating device. 4,118,226, Cl. 55-279.000.
Bouwhuis, Gijsbertus; Braat, Josephus Johannes Maria; and Jacobs, Bernardus Antonius Johannus, to U.S. Philips Corporation. Optical videodisc with variable width tracks. 4,118,734, Cl. 358-128.000.
Bowman, Walter A.; and Wessel, Richard L., to United States Steel Corporation. Plug-type coke oven door. 4,118,284, Cl. 202-248.000.
Boyce, Peter Howard, to Plessey Handel und Investments A.G. Taximeter fare computing devices. 4,118,775, Cl. 364-467.000.
Boyle, Delbert D. Bathroom deodorizer and odorizer devices and methods of making and using the same. 4,117,559, Cl. 4-209.00R.
Braat, Josephus Johannes Maria: *See*—
Bouwhuis, Gijsbertus; Braat, Josephus Johannes Maria; and Jacobs, Bernardus Antonius Johannus, 4,118,734, Cl. 358-128.000.
Brabetz, Hartmut; Kemenater, Christof; Six, Franz; and Kaiser, Wilhelm, to Wacker-Chemie GmbH. Adhesive aqueous dispersions of

polyvinyl alcohol graft polymers with acidic hardeners and process of production. 4,118,357, Cl. 260-29.6WA.

Bradley, Guy M.: *See*—
Talley, Charles P.; Bradley, Guy M.; and Guliana, Ronald T., 4,118,316, Cl. 210-31.00C.

Braga, Albert T.: *See*—
Brenner, Robert A.; Cuthbert, Victor W.; and Braga, Albert T., 4,118,647, Cl. 310-239.000.

Brandenstein, Manfred: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,118,078, Cl. 308-6.00C.

Brandt, H. David: *See*—
Goell, James E.; and Brandt, H. David, 4,118,100, Cl. 350-96.200.

Brassat, Bert: *See*—
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Bratkowski, Walter V.: *See*—
Shoupp, William E.; Bratkowski, Walter V.; and Boomgaard, Dirk J., 4,118,717, Cl. 354-43.000.

Braund, Darwin G.; Dolge, Kendall L.; Goings, Richard L.; and Steele, Robert L., to Agway, Inc. Method of formulating dairy cattle rations. 4,118,513, Cl. 426-2.000.

Brax, Jean Albert, to Saint-Gobain Industries. Method and apparatus for heating glass in a forehearth. 4,118,215, Cl. 65-134.000.

Brazhnikov, Nikolai Ivanovich. Method for checking thickness of sheet materials by using acoustic oscillation and device for effecting same. 4,117,732, Cl. 73-599.000.

Bremer, Hans: *See*—
Schabert, Hans-Peter; Bremer, Hans; and Strickroth, Erich, 4,118,277, Cl. 176-87.000.

Brennan, James P., to Olin Corporation. Process for producing sodium dichloroisocyanurate. 4,118,570, Cl. 544-190.000.

Brenner, Douglas, to Exxon Research & Engineering Co. Plasticization of neutralized sulfonated elastomeric polymer. 4,118,359, Cl. 260-30.80R.

Brenner, Douglas: *See*—
Makowski, Henry S.; and Brenner, Douglas, 4,118,362, Cl. 260-32.60A.

Brenner, L. Martin; and Loev, Bernard, to SmithKline Corporation. 3-Morpholino-2-heterocyclic-thiopropanamides. 4,118,567, Cl. 544-131.000.

Brenner, Robert A.; Cuthbert, Victor W.; and Braga, Albert T., to Whirlpool Corporation. Preassembleable brush assembly. 4,118,647, Cl. 310-239.000.

Brey, Hans: *See*—
United States of America, National Aeronautics and Space Administration; Brey, Hans; and Geise, Philip E., Jr., 4,118,701, Cl. 343-6.00R.

Brezinski, Donald P.; and Powell, William E., to Corning Glass Works. Valley sensor for an electrophoretic analyzer. 4,118,781, Cl. 364-525.000.

Brinkmeier, Friedhelm, to Windmoller & Holscher. Apparatus for forming bundles of flattened bags. 4,117,771, Cl. 93-93.0HT.

Brinnand, Antony G.: *See*—
Anderson, Martin; and Brinnand, Antony G., 4,118,489, Cl. 424-246.000.

Bristol-Myers Company: *See*—
Horning, Donald E.; Morris, Leeson R.; and Douglas, James L., 4,118,566, Cl. 544-105.000.
Lim, Gary M. F.; and Perron, Yvon G., 4,118,563, Cl. 544-26.000.

British Communications Corporation Limited: *See*—
Siekierski, Wladyslaw; and Crane, Richard A., 4,118,661, Cl. 320-40.000.

British Industrial Plastics Limited: *See*—
James, Harold; and Buggy, Martin, 4,118,365, Cl. 260-39.00R.
Murray, Christopher Linley; and Vale, Corwyn Philip, 4,118,351, Cl. 260-18.00N.

Broad Corporation: *See*—
Shurcliff, William A., 4,117,882, Cl. 165-104.00S.

Brodie, Michael. Multi-purpose puller. 4,117,581, Cl. 29-261.000.

Brokmeier, Dieter: *See*—
Lindner, Christian; Suling, Carlhans; Arend, Gunter; Brokmeier, Dieter; and Nischk, Gunther, 4,118,375, Cl. 526-240.000.

Bron, Dan. Pump for variable dosing. 4,118,152, Cl. 417-254.000.

Brookes, Malcolm J.: *See*—
Spranger, Douglas M.; Brookes, Malcolm J.; and Mulhauser, Paul J., 4,118,048, Cl. 280-47.350.

Brooks, Carter D.: *See*—
Wechter, William J.; and Brooks, Carter D., 4,118,484, Cl. 424-180.000.

Brooks, George Mahue: *See*—
Rayfield, Wilson Parker; Ferguson, Ronald Worden; and Brooks, George Mahue, 4,118,022, Cl. 270-52.500.

Brooks, Julius E.: *See*—
Johnson, James H.; Fowler, Arnold L.; Brooks, Julius E.; and Friend, Harvey H., 4,117,761, Cl. 89-129.00B.

Brose, Harlan F., to United Technologies Corporation. Inlet air preheating for pyrolysis system. 4,117,786, Cl. 110-229.000.

Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, to BASF Farben & Fasern AG. Compositions for the production of opaque coatings by radiation. 4,118,366, Cl. 260-40.00R.

Brown, Daniel Maitland, to University of California, The Regents of the. Underwater release mechanism. 4,118,060, Cl. 294-83.00R.

Brown, Esther S. Bed urinal apparatus. 4,117,845, Cl. 128-295.000.

Brown, Richard N.: *See*—
Corsmeier, Robert J.; and Brown, Richard N., 4,118,136, Cl. 403-386.000.

Brown, William J.: *See*—
Waxelbaum, Paul M.; Harris, Fred A.; and Brown, William J., 4,117,984, Cl. 241-73.000.

Brownfield, Jerry A. Solar collector. 4,117,828, Cl. 126-270.000.

Browning, Paul E. Leaf collector and comminutor. 4,117,983, Cl. 241-55.000.

Broxterman, William E.; Urchick, Demetrius; Schmidt, Donald L.; and Hoornstra, Clayton W., to Dow Chemical Company, The. Fused poly-nuclear aromatic cyclic sulfonium zwitterions and polymers thereof. 4,118,297, Cl. 204-159.110.

Brubaker, Charles W., to Raymond Lee Organization, Inc., The, a part interest. Sled roller device. 4,118,043, Cl. 280-8.000.

Bruce, Miles Melvin, Jr.: *See*—
United States of America, National Aeronautics and Space Administration; Wall, William A., Jr.; Ives, Robert E.; Bruce, Miles Melvin, Jr.; Pryor, Peter Paul, Jr.; and Gard, Leslie H., 4,118,620, Cl. 219-124.320.

Brunswick Corporation: *See*—
Abbott, Harry Thomas, 4,118,262, Cl. 156-175.000.
Benedyk, Joseph C.; and Stratton, Richard O., 4,118,530, Cl. 428-92.000.

Bryant, Ellis H., Jr. Precision automatic local time decoding apparatus. 4,117,661, Cl. 58-24.00R.

Buchel, Karl Heinz: *See*—
Regel, Erik; Draber, Wilfried; Buchel, Karl Heinz; and Plempel, Manfred, 4,118,487, Cl. 424-232.000.

Buck, Hermann: *See*—
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Buckbee-Mears Company: *See*—
VanderWert, Terry L., 4,118,252, Cl. 148-6.300.

Buckethal, Paul J.; Groff, Jerome J.; Halsall, Vincent M.; and Hennen, Roy E., to Globe-Union, Inc. Composite battery plate grid and method of manufacturing. 4,118,553, Cl. 429-234.000.

Buckeye Molding Company: *See*—
Allen, David O., 4,117,950, Cl. 220-306.000.

Bucking, Hans-Walter: *See*—
Steckelberg, Willi; Panke, Hans Ludwig; May, Adolf; and Bucking, Hans-Walter, 4,118,324, Cl. 252-8.900.

Bucknell, Ernest H.; and Rauh, Jack K., to TRE Corporation. Flapper type spout assembly. 4,117,858, Cl. 137-119.000.

Budnick, Lawrence T., to Altek Systems, Inc. Battery cable terminal assembly and method of manufacture. 4,118,097, Cl. 339-232.000.

Buggy, Martin: *See*—
James, Harold; and Buggy, Martin, 4,118,365, Cl. 260-39.00R.

Bullock, Paul, to Robin Products Company. Crank handle for window regulator shaft. 4,117,568, Cl. 16-110.00R.

Bulova Watch Company, Inc.: *See*—
Mosimann, Peter Hubert; and Sutter, Hans Rudolf, 4,117,663, Cl. 58-85.500.
Walker, Erich, 4,117,660, Cl. 58-23.00R.

Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-16-phenyl-PGF compounds. 4,118,584, Cl. 560-55.000.

Bureau de Recherches Geologiques et Minieres: *See*—
Barbery, Gilles; and Cecile, Jean-Luc, 4,118,312, Cl. 209-166.000.

Burer, Franz, to Sulzer Brothers Limited. Yarn clamp for a weaving machine. 4,117,871, Cl. 139-429.000.

Burg, John S.; Davidson, Donald M.; McClure, Marvin K.; and Sannel, Benjamin H., to Pako Corporation. Dryer for photographic processors. 4,117,604, Cl. 34-70.000.

Burin, Viktor Leontievich; Tjutjunnikov, Anatoly Borisovich; Golosov, Viktor Nikolaevich; Tarynin, Evgeny Konstantinovich; Pogorely, Nikolai Pavlovich; and Lukyanenko, Vladimir Matveevich. Valve tray for mass-exchange apparatus. 4,118,446, Cl. 261-114.0VT.

Burns, Simon Pierce; and Walton, John Monte, to Texaco Development Corp. Process for reducing the acidity of organic polymeric isocyanates. 4,118,286, Cl. 203-89.000.

Burroughs Corporation: *See*—
Gibbs, Stephen R., 4,118,303, Cl. 204-224.00R.
Gyi, Ko Ko; and Ragle, Herbert Underwood, 4,118,746, Cl. 360-99.000.
Rayfield, Wilson Parker; Ferguson, Ronald Worden; and Brooks, George Mahue, 4,118,022, Cl. 270-52.500.

Butculescu, Michael, to Deere & Company. Transmission for crawler tractors. 4,117,744, Cl. 74-665.00G.

Butler, Gene R.: *See*—
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Butler Manufacturing Company: *See*—
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Butschko, Gerhard: *See*—
Weber, Paul; Lankes, Erich; Butschko, Gerhard; Ritzmann, Horst; and Bohm, Peter Wolfgang, 4,118,177, Cl. 432-14.000.

Buttinoni, Ada: *See*—
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Byrn, James H., to Sheller-Globe Corporation. Soft rubber steering wheel, composition and method of manufacture. 4,118,455, Cl. 264-129.000.

C. Conradty Nurnberg GmbH & Co. KG: *See*—
Schieber, Franz, 4,118,592, Cl. 13-18.00R.

C.I. Hayes Inc.: *See—*
Westeren, Herbert W.; and Harrison, Ronald A., 4,118,016, Cl. 266-130.000.
Cabagnero, Ramon Jane. Collapsible stroller. 4,118,052, Cl. 280-642.000.
Cabot Corporation: *See—*
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Cahen, Raymond M.: *See—*
Debus, Henri R.; and Cahen, Raymond M., 4,118,342, Cl. 252-439.000.
Cahill, Richard C. Guard for preventing human injuries on impact with furnishings. 4,117,782, Cl. 108-27.000.
Caldwell, Harlan D.; Kuo, Cho-Chou; and Kenny, George E., to Research Corporation. Antigen for trachoma lymphogranuloma venereum (LGV) and non-gonococcal urethritis (NGU). 4,118,469, Cl. 424-1.000.
Calfo, Raymond M.; Dailey, George F.; Alkire, Gerald R.; and Mulach, Arthur, to Westinghouse Electric Corp. Dual position air gap baffle assembly for a dynamoelectric machine. 4,118,645, Cl. 310-53.000.
Calgon Corporation: *See—*
Talley, Charles P.; Bradley, Guy M.; and Guliana, Ronald T., 4,118,316, Cl. 210-31.00C.
Welder, Gerald Elvin; Lang, Edward Russell; and Slagle, Charles Wilmer, 4,118,318, Cl. 210-58.000.
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California Metal Enameling Company: *See—*
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California Precision: *See—*
Kredo, Theodore A., 4,118,766, Cl. 362-427.000.
Calvi, Salvatore J.; and Stelben, John J., to Pitney-Bowes, Inc. Xerographic fusing apparatus. 4,118,178, Cl. 432-35.000.
Campbell, David Lester, to Ballas, George C. Apparatus for supporting a member from a drop-tile ceiling. 4,118,000, Cl. 248-228.000.
Canadian D. A. Stuart Oil Co. Limited: *See—*
Scherf, Gerhard Wolfgang Helmut, 4,118,565, Cl. 544-87.000.
Canadian Patents and Development Limited: *See—*
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Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Masaharu; and Shinoda, Nobuhiko, 4,118,713, Cl. 354-23.00D.
Okajima, Hidekazu; and Iwama, Hideto, 4,118,714, Cl. 354-31.000.
Suzuki, Masayuki; Sakurada, Nobuaki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyashu, 4,118,716, Cl. 354-38.000.
Carba S.A.: *See—*
Gabus, Jean-Claude, 4,117,863, Cl. 137-601.000.
Gabus, Jean-Claude, 4,118,612, Cl. 200-81.90R.
Carleton, Richard D.; and Bhattacharyya, Ajay, to United States of America, Energy. Variable flow control for a nuclear reactor control rod. 4,118,275, Cl. 176-36.00R.
Carlin, Jack M. Pressure differential flow retardant valve. 4,117,860, Cl. 137-513.500.
Carlson, Donald E., to Mark Controls Corporation. Frostproof backflow preventer. 4,117,856, Cl. 137-62.000.
Carlson, Gerald L.: *See—*
Phillips, David C.; Hickam, William M.; and Carlson, Gerald L., 4,117,713, Cl. 73-17.00R.
Carpaneti, Edoardo: *See—*
Vargiu, Silvio; Carpaneti, Edoardo; Crespolini, Giancarlo; and Pitzalis, Mario, 4,118,555, Cl. 526-76.000.
Carr, John B., to Shell Oil Company. Benzodioxincarboxamide lipogenesis inhibitors. 4,118,507, Cl. 424-278.000.
Carre, Jean-Jacques; and Levrai, Roland, to Bendix Corporation, The. Vacuum booster. 4,117,769, Cl. 91-170.00R.
Carre, Jean-Jacques, to Societe Anonyme D.B.A. Braking correction device. 4,118,077, Cl. 303-6.00C.
Carrubba, Robert V.: *See—*
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Carvalko, Joseph R.; and Tolmie, Robert J., Jr., to Pitney-Bowes, Inc. Developer solution level detector. 4,118,634, Cl. 250-577.000.
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Case, Cecil L.: *See—*
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Casey, Donald James; and Epstein, Martin, to American Cyanamid Company. Normally-solid, bioabsorbable, hydrolyzable, polymeric reaction product. 4,118,470, Cl. 424-19.000.
Cassar, Luigi; and Gardano, Andrea, to Montedison S.p.A. Process for preparing oxalic acid and esters of same. 4,118,589, Cl. 560-204.000.
Casto, Walter V.; DeLong, Lawrence W.; Markley, Theodore J.; and Struger, Odo J., to Allen-Bradley Company. Program protection module for programmable controller. 4,118,789, Cl. 364-900.000.
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Cato Research Corporation: *See—*
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Cawley, William H.: *See—*
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Cazenave, Paul, to Societe d'Assistance Technique pour Produits Nestle, S.A. Isolation of an aromatic fraction of coffee. 4,118,521, Cl. 426-651.000.
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Chambers, Melvin T.; and Hardy, Herbert L., to Polaroid Corporation. Automatic system for handling and processing photographic film strips. 4,118,737, Cl. 352-130.000.
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Chang, I-Cheng; and Hecht, David L., to Itek Corporation. Second order birefringent acousto-optic device. 4,118,113, Cl. 350-358.000.
Chang, Kuang-Chou; Heller, Adam; and Miller, Barry, to Bell Telephone Laboratories, Incorporated. Method of operating a liquid-semiconductor junction photocell. 4,118,548, Cl. 429-111.000.
Charles, Ronald A.; Jones, Paul W.; Staples, John L.; and Wiegner, Joseph R., to McDonnell Douglas Corporation. Automated microbial analyzer. 4,118,280, Cl. 195-127.000.
Cheary, Walter Graham: *See—*
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Chen, Nai Yuen, to Mobil Oil Corporation. Conversion of oxygenated compounds. 4,118,431, Cl. 260-668.00R.
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Witzke, Horst; Chen, Schoen-nan; Deb, Satyendra K.; Jost, Steven Robert; Reichman, Joseph; and Russak, Michael A., 4,118,547, Cl. 429-111.000.
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Hotten, Bruce W., 4,118,329, Cl. 252-32.500.
Hotten, Bruce W., 4,118,330, Cl. 252-32.500.
Chireau, Roland F.; and Gunther, Ronald G., to Yardney Electric Corporation. Mercury-free zinc electrode. 4,118,551, Cl. 429-207.000.
Chireau, Roland F.; and Berchielli, Aldo S., to Yardney Electric Corporation. Self-supporting electrode and method of making same. 4,118,552, Cl. 429-219.000.
Chizhov, Stanislav Viktorovich: *See—*
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Kuist, Charles H.; Squitieri, Vincent; and Seeger, Richard E., 4,118,102, Cl. 339-17.00F.
Christ, Alfred; Lehmann, Helmut; Kantor, Ludwig; and Miller, Helmut, to Sulzer Brothers Limited. Contactless seal. 4,118,040, Cl. 277-75.000.
Christian, Alfred, to Hydrotile Canada Limited. Packerhead pipe making machine. 4,118,165, Cl. 425-262.000.
Christian, Merlin B. Thermal air powered electric generator system. 4,118,636, Cl. 290-52.000.
Christison, Sommerville Grant; Magnuson, John Edwin; and Tham, Wing Chong, to PACCAR Of Canada, Ltd. Self-energizing winch brake and drive. 4,118,013, Cl. 254-187.500.
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Beall, George H.; Chyung, Kenneth; and Hoda, Syed N., 4,118,237, Cl. 106-39.600.
Ciaramella, Alberto, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Device for automatically loading the central memory of electronic processors. 4,117,974, Cl. 235-304.000.

Ciba-Geigy AG: *See—*
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,118,232, Cl. 96-99.000.
Ciba-Geigy Corporation: *See—*
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Cimetiere, Louis; and Gonda, Richard, to Societe de Vente de l'Aluminium Pechiney. Tensionless metallic band of high thermal conductivity in a continuous casting machine. 4,117,880, Cl. 164-433.000.
Cincinnati Milacron Chemicals Inc.: *See—*
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Henline, John W.; Bauer, James J.; and Morehouse, James O., 4,117,902, Cl. 180-54.00R.
Sagaser, Thomas M.; and Mather, Joseph M., 4,117,899, Cl. 180-6.480.
Clark, William James Rowley: *See—*
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Clayton, Ralph S. Colon catheter. 4,117,847, Cl. 128-348.000.
Cleare, Peter John Vernon; Kaye, Albert Edward; and Milner, David John, to Imperial Chemical Industries Limited. Preparation cyano substituted cyclopropane. 4,118,412, Cl. 260-464.000.
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Fray, Derek John; and Cleland, James Henry, 4,118,292, Cl. 204-67.000.
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Metcalf, Robert L.; and Coats, Joel R., 4,118,424, Cl. 260-613.00R.
Cockett, Stewart Graham; Taylor, Jeffrey Philip; Craven, Peter; and Farmer, Alan Charles, to Post Office. Data processing equipment. 4,118,790, Cl. 364-900.000.
Cody, William H. Liquid game amusement system. 4,118,027, Cl. 273-1.00L.
Coffen, David Llewellyn, to Hoffmann-La Roche Inc. Novel 4-phenoxy-5-sulfamylbenzoic acid derivatives. 4,118,587, Cl. 560-251.000.
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Cohon, Bertram J. Adjustable hanger for electric lights. 4,118,760, Cl. 362-239.000.
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Apostolatos, George Nikolas; Bohrer, James Calvin; and Inamorato, Jack Thomas, 4,118,332, Cl. 252-107.000.
Dugan, Bernard Baron; and Welgemoed, Jacobus Cornelius, 4,118,333, Cl. 252-135.000.
Gaffar, Abdul; and Niles, Hollandra P., 4,118,472, Cl. 424-54.000.
Gaffar, Abdul; and Niles, Hollandra P., 4,118,473, Cl. 424-54.000.
Gaffar, Abdul; and Niles, Hollandra P., 4,118,474, Cl. 424-54.000.
Gaffar, Abdul; and Niles, Hollandra P., 4,118,475, Cl. 424-54.000.
Gaffar, Abdul; and Niles, Hollandra P., 4,118,476, Cl. 424-54.000.
Pensak, Philip, 4,118,471, Cl. 424-52.000.
Seugnet, Monique, 4,118,327, Cl. 252-8.800.
Collins, Harry F., to Service Ideas, Inc. Insulated server with cooperating pans. 4,117,948, Cl. 220-410.000.
Collins, William J. Device for sampling molten metal. 4,118,015, Cl. 266-44.000.
Collins, William L. Digital grade averager. 4,118,783, Cl. 364-734.000.
Combustion Engineering, Inc.: *See—*
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Comer, Donald T., to Precision Monolithics, Inc. Digital to analog converter with binary and binary coded decimal modes. 4,118,699, Cl. 340-347.0DA.
Compagnie Generale d'Electricite: *See—*
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Conibear, Frank R., to Woodstream Corporation. Modified jaws for animal trap. 4,117,623, Cl. 43-90.000.
Connolly, Denis J., to United States of America, National Aeronautics and Space Administration. Traveling wave tube circuit. 4,118,671, Cl. 330-43.000.
Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. 5-Phenenyltris (ureylene) triisophthalic acid salts. 4,118,418, Cl. 562-439.000.
Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. Anionic benzene tetrakis carbonylimino isophthalic acid salts. 4,118,585, Cl. 560-44.000.
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Continental Oil Company: *See—*
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Fertl, Walter H.; and Gant, Preston L., 4,118,623, Cl. 250-253.000.
Conwed Corporation: *See—*
Larsen, Ronald L.; and Berry, Clifford W., 4,117,932, Cl. 206-419.000.
Cook, John E., to Fram Corporation. Ambient pressure sensor. 4,117,724, Cl. 73-386.000.
Cook, William H., Jr. Method of manufacturing structural honeycomb with integral heat radiation shields, and the resulting product thereof. 4,118,263, Cl. 156-197.000.
Cooke, Gordon R.; and Franklin, Kevin T., to United States of America, Navy. Digital to graphic character generator. 4,118,709, Cl. 346-33.00R.
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Cooper, Roy F., to Sargent Industries. Pre-stressed rod joint. 4,118,135, Cl. 403-361.000.
Coppa, Anthony Patrick; and Zauderer, Bert, to General Electric Company. Compliant MHD electrode structure. 4,118,643, Cl. 310-11.000.
Corluy, Hans Josephus; Moll, Franz; Muller, Herbert; and Hase, Marie, to Agfa-Gevaert N.V. Photographic materials suited for the production of color separations. 4,118,228, Cl. 96-17.000.
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Corsmeier, Robert J.; and Brown, Richard N., to General Electric Company. Apparatus for attaching tubing to a rotating disk. 4,118,136, Cl. 403-386.000.
Coulson, John N., Jr.: *See—*
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Craven, James M. Adhesive composition. 4,118,436, Cl. 260-826.000.
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Cockett, Stewart Graham; Taylor, Jeffrey Philip; Craven, Peter; and Farmer, Alan Charles, 4,118,790, Cl. 364-900.000.
Crawford, George W. Grooved-gear wire puller. 4,117,873, Cl. 140-105.000.
Crawford, Ian Drummond; Marshall, Henry Bruce; and Cormack, Robert John, to Ferranti Limited. Optical apparatus for controlling the direction of a beam of optical radiation. 4,118,109, Cl. 350-285.000.
Crawley, Lantz Stephen: *See—*
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Cristiani, Athos. Tobacco rod forming apparatus in cigarette makers. 4,117,851, Cl. 131-84.00B.
Crompton, Kenneth J.: *See—*
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Crosby, James B., Jr.: *See—*
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Current, Wayne A.; Genge, Bruce I.; Hurme, Herbert J.; and Zocher,

Josef, to Singer Company, The. Dual color coded sewing machine needles. 4,117,791, Cl. 112-222.000.
Cusano, Dominic A.; and Webster, Harold F., to General Electric Company. Photoflash lamp array having high voltage shorting type flash lamps and radiation sensitive switching elements. 4,118,758, Cl. 362-6.000.
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Daicel, Ltd.: *See—*
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Stannow, Jorgen Christian; Kjeldsen, Kjeld; Tankred, Hans Jurgen; and Madsen, Per Johan, 4,118,153, Cl. 417-363.000.
Vind, Holger Vilhelm, 4,118,753, Cl. 361-331.000.
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David, Karl-Heinz, to Organisation Europeenne de Recherches Spatiales. Cone optical system. 4,118,622, Cl. 250-216.000.
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Davies, Norman; Langley, Morley P.; and Peppel, Howard C., deceased (by Peppel, Virginia L., administrator), to Westinghouse Electric Corp. Self-cooled metal-clad switchgear. 4,118,755, Cl. 361-379.000.
Davis, Royston H.; and Searle, Robert J. G., to Shell Oil Company. Dispirocyclopropane carboxylate pesticides. 4,118,510, Cl. 424-305.000.
Dawes, Keith; and Rowley, Roger James, to Malaysian Rubber Producers Research Association, The. Reinforced rubber. 4,118,367, Cl. 260-42.370.
Dawson, Robert L., to Prima International. Wire rack. 4,117,936, Cl. 211-50.000.
Deb, Satyendra K.: *See—*
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Witzke, Horst; Chen, Schoen-nan; Deb, Satyendra K.; Jost, Steven Robert; Reichman, Joseph; and Russak, Michael A., 4,118,547, Cl. 429-111.000.
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Del Mei, Luigi Giovanni. Electro-thermal lock. 4,117,701, Cl. 70-150.000.
Del Mei, Luigi Giovanni. Electrical contact devices. 4,118,090, Cl. 339-12.00R.
DeLomba, Donald A. Support for holding Syrian bread. 4,118,021, Cl. 269-86.000.
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Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., to Ayerst, McKenna & Harrison Limited. Pyrano- and thiopyranoindole derivatives. 4,118,394, Cl. 260-326.280.
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Dennis, Bethel E. Canine toilet. 4,117,555, Cl. 4-1.000.
Denny, Bernard Peter. Fishing reel. 4,117,990, Cl. 242-84.52A.
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De Nora, Vittorio; and De Nora, Oronzio, to Diamond Shamrock Technologies S. A. Anode constructions for electrolysis cells. 4,118,306, Cl. 204-284.000.
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Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, 4,118,366, Cl. 260-40.00R.
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Determann, Helmut; Bernt, Erich; Dollacker, Werner; Gutmann, Ingeborg, deceased (by Gutmann, Siegfried, administrator); and by Engelhardt, Gudrun, administrator, to Boehringer Mannheim GmbH. Stabilizing agent for enzymes. 4,118,279, Cl. 195-63.000.
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Dewan, Shashi B.: *See—*
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Pellegri, Alberto, 4,118,294, Cl. 204-129.000.
Dickens, Lawrence E., to Westinghouse Electric Corp. Image phased and idler frequency controlled mixer formed on an integrated circuit dielectric substrate. 4,118,670, Cl. 325-446.000.
Diener, Fred L.: *See—*
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Dierberger, James Albert, to United Technologies Corporation. Coolable wall. 4,118,146, Cl. 416-97.00A.
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Dietrich, Manfred: *See—*
Pedain, Josef; Wellner, Wolfgang; Gruber, Hermann; and Dietrich, Manfred, 4,118,376, Cl. 528-59.000.
Dietrich, William John, Sr.; and Sizelove, Cary Leon, to DMI, Inc. Agricultural folding tool bar with rigid cross frame. 4,117,892, Cl. 172-311.000.
Dietz, Charles F.: *See—*
Friedel, William C., Jr.; and Dietz, Charles F., 4,118,311, Cl. 209-75.000.
Dietz, Wolfgang Friedrich Wilhelm, to RCA Corporation. North-south pincushion distortion correction circuit. 4,118,656, Cl. 315-371.000.
Diggs, Richard E. Apparatus for desalinating water. 4,118,283, Cl. 202-160.000.
Dijkstra, Hendrik: *See—*
Visser, Johannes; Oosthoek, Raoul Henricus Josephus; Groeneweg, Jan Willem; and Dijkstra, Hendrik, 4,118,520, Cl. 426-574.000.
Dillow, Paul E. Radio antenna mounting device. 4,118,003, Cl. 248-539.000.

Di Vita, Sam: *See—*
Au Coin, Thomas R.; Di Vita, Sam; and Wade, Melvin J., 4,118,211, Cl. 65-3.00R.
DMI, Inc.: *See—*
Dietrich, William John, Sr.; and Sizelove, Cary Leon, 4,117,892, Cl. 172-311.000.
Dobberpuhl, Dale Rudolph, to Deere & Company. Rotary tiller tine assembly wire clip. 4,118,132, Cl. 403-24.000.
Dobo, Emerick J., to Monsanto Company. Method for producing fibrous steel matts. 4,118,225, Cl. 75-207.000.
Dobson, Thomas A.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,118,394, Cl. 260-326.280.
Dr. Johannes Heidenhain GmbH., Firma: *See—*
Kober, Hans-Rudolf; and Ernst, Alfons, 4,117,601, Cl. 33-172.00E.
Doehler, Peter: *See—*
Baumgartner, Erich Rudolf; and Doehler, Peter, 4,117,612, Cl. 38-91.000.
Doering, Arlin B.; and Volness, Kenneth H., to Minnesota Mining and Manufacturing Company. Member for limiting air door movement in a disk cartridge. 4,118,748, Cl. 360-133.000.
Dohadwalla, Alihussein Nomanbhai: *See—*
Bhat, Sujata Vasudev; de Souza, Noel John; Dornauer, Horst; Bhattacharya, Bani Kanta; and Dohadwalla, Alihussein Nomanbhai, 4,118,508, Cl. 424-283.000.
Doherty, John, Jr., to Texas Instruments Incorporated. Multi-function thermostatic valve. 4,117,976, Cl. 236-48.00R.
Doi, Toru: *See—*
Niki, Hiroshi; Deya, Eiki; Doi, Toru; Igarashi, Seiichiro; and Hayashi, Hiromichi, 4,118,517, Cl. 426-271.000.
Dolge, Kendall L.: *See—*
Braund, Darwin G.; Dolge, Kendall L.; Goings, Richard L.; and Steele, Robert L., 4,118,513, Cl. 426-2.000.
Dollacker, Werner: *See—*
Determann, Helmut; Bernt, Erich; Dollacker, Werner; Gutmann, Ingeborg, deceased; and Engelhardt, Gudrun, administrator, 4,118,279, Cl. 195-63.000.
Dombkowsi, Walter Stephen; and Rosin, Erwin August, to Bell Telephone Laboratories Incorporated. Dual slope temperature differential shutdown control for gas turbines. 4,117,670, Cl. 60-39.28T.
Domes, E. A.: *See—*
Vacval, Dusan M.; and Domes, E. A., 4,117,911, Cl. 188-73.300.
Dominion Auto Accessories Limited: *See—*
Bleiweiss, Arthur F.; Crompton, Kenneth J.; and Urbanek, Karel, 4,118,764, Cl. 362-369.000.
Urbanek, Karel, 4,118,767, Cl. 362-455.000.
Donohue, Henry Patrick, to Fenestra. Reflectant foil insulated steel doors. 4,118,543, Cl. 428-615.000.
Dorf, Helen A. Recreational vehicle shelf bars. 4,118,087, Cl. 312-291.000.
Dornauer, Horst: *See—*
Bhat, Sujata Vasudev; de Souza, Noel John; Dornauer, Horst; Bhattacharya, Bani Kanta; and Dohadwalla, Alihussein Nomanbhai, 4,118,508, Cl. 424-283.000.
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, to Avery Products Corporation; and Loctite Corporation, part interest to each. Anaerobic pressure sensitive adhesive composition. 4,118,442, Cl. 260-885.000.
Dougherty, James: *See—*
Victor, Joe M.; and Dougherty, James, 4,118,300, Cl. 204-195.00T.
Douglas, James L.: *See—*
Horning, Donald E.; Morris, Leeson R.; and Douglas, James L., 4,118,566, Cl. 544-105.000.
Dow Chemical Company, The: *See—*
Broxterman, William E.; Urchick, Demetrius; Schmidt, Donald L.; and Hoornstra, Clayton W., 4,118,297, Cl. 204-159.110.
DeShon, Harold D., 4,118,344, Cl. 252-559.000.
Dunbar, Joseph E.; and Begin, Louis E., 4,118,564, Cl. 544-82.000.
Juckniess, Paul R.; and Johnson, David R., 4,118,291, Cl. 204-64.00T.
Orvik, Jon A., 4,118,373, Cl. 528-73.000.
Smith, Harry A., 4,118,363, Cl. 260-33.20R.
Draber, Wilfried: *See—*
Regel, Erik; Draber, Wilfried; Buchel, Karl Heinz; and Plempel, Manfred, 4,118,487, Cl. 424-232.000.
Draiswerke GmbH: *See—*
Engels, Kaspar, 4,117,981, Cl. 241-46.150.
Drescher, Erwin, to Melsunger Metall-Werk, Erwin Drescher. Safe with recessed dial. 4,117,785, Cl. 109-59.00T.
Drewe, Nigel Wyndham; Hodson, Peter Robin; and Robson, Clive Gilroy, to Imperial Chemical Industries Limited. Formulation process. 4,118,218, Cl. 71-92.000.
Drui, Mark Simonovich: *See—*
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Zjukin, Nikolai Stepanovich; Kostjuk, Boris Dmitrievich; Shaikevich, Stanislava Stanislavovna; Motsak, Yaroslav Feodosievich; Fedulaev, Vitaly Pavlovich; Kolchemanov, Nikolai Alexandrovich; Ugarov, Valentin Mikhailovich; Losev, Viktor Vasilievich; Drui, Mark Simonovich; Lavrinovich, Alla Alexandrovna; Shpotakovsky, Dmitry Fedorovich; and Chizhov, Stanislav Viktorovich, 4,117,968, Cl. 228-124.000.
Dubinenko, Askold Fedorovich: *See—*
Kopelev, Fridrikh Lvovich; Kossek, Valentin Vladimirovich; Dubinenko, Askold Fedorovich; and Sherstinsky, Semen Markovich, 4,117,750, Cl. 82-30.000.
Duffey, George. Atomizer valve assembly. 4,117,957, Cl. 222-321.000.
Dugan, Bernard Baron; and Welgemoed, Jacobus Cornelius, to Colgate-Palmolive Company. Manufacture of particulate detergents. 4,118,333, Cl. 252-135.000.
Duggan, J. E., to Gould Inc. Electrical panel having molded base pan. 4,118,754, Cl. 361-355.000.
Duijf, Gerrit: *See—*
Van Praag, Michel; and Duijf, Gerrit, 4,118,516, Cl. 426-96.000.
Dummermuth, Ernst: *See—*
Struger, Odo J.; McAdams, Timothy E.; and Dummermuth, Ernst, 4,118,792, Cl. 364-900.000.
Dunbar, Joseph E.; and Begin, Louis E., to Dow Chemical Company, The. 3-6 Bis(morpholinoalkylthio)-pyridazines. 4,118,564, Cl. 544-82.000.
Duncan Electric Co., Inc.: *See—*
Milligan, James W., 4,118,667, Cl. 324-110.000.
Dunning, John M., III, to Dunning, Ltd. Knock-down furniture system. 4,118,088, Cl. 312-350.000.
Dunning, Ltd.: *See—*
Dunning, John M., III, 4,118,088, Cl. 312-350.000.
Du Pont de Nemours, E. I., and Company: *See—*
Forsten, Herman Hans, 4,117,578, Cl. 28-112.000.
Schaefgen, John Raymond, 4,118,372, Cl. 528-190.000.
Smith, Sanford Byrom, 4,118,182, Cl. 8-7.000.
Stanley, Harry Eugene, 4,118,534, Cl. 428-370.000.
Vary, Eva M.; and Vassiliou, Eustathios, 4,118,537, Cl. 428-422.000.
Walker, Charles Carey, 4,118,582, Cl. 560-96.000.
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, to Smith Kline & French Laboratories Limited. Heterocyclic-methylthioalkyl-amidines. 4,118,496, Cl. 424-263.000.
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, to Smith Kline & French Laboratories Limited. Amidinoformic and amidino-sulphinic acid derivatives. 4,118,502, Cl. 424-273.00R.
Dwinell, Davis B., to American Flange & Manufacturing Co. Inc. Threaded closure. 4,117,949, Cl. 220-304.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Amort, Jurgen; and Nestler, Heinz, 4,118,540, Cl. 428-447.000.
Falkenhain, Wilhelm; and Feder, Ernst, 4,118,459, Cl. 423-142.000.
Hadamovsky, Eugen; Hoppe, Wolfgang; Overhausen, Hans-Walter; Piotrowski, Bernhard; Schmid, Wehrhart; Schreiber, Georg; and Schroeder, Heinz, 4,118,313, Cl. 560-78.000.
Dynatech Laboratories Incorporated: *See—*
Underwood, Willie Bruce, 4,118,625, Cl. 250-343.000.
Dyrda, Edward: *See—*
Najmowicz, Zenon; Dyrda, Edward; and Zakrzewski, Jan, 4,117,878, Cl. 164-292.000.
Dzus Fastener Co. Inc.: *See—*
Schenk, Peter, 4,117,928, Cl. 206-320.000.
E. R. Squibb & Sons, Inc.: *See—*
Turk, Chester F.; and Krapcho, John, 4,118,558, Cl. 542-429.000.
Eagle-Picher Industries, Inc.: *See—*
Cornelius, James W.; and Mallon, Robert T., 4,117,798, Cl. 118-4.000.
Eakman, James M.; Nahas, Nicholas C.; and Euker, Charles A., Jr., to Exxon Research & Engineering Co. Process for the production of an intermediate Btu gas. 4,118,204, Cl. 48-197.00R.
Earsley, Melvin L.: *See—*
Bingle, Gerald L.; and Earsley, Melvin L., 4,118,259, Cl. 156-73.100.
Eastman Kodak Company: *See—*
Dannelly, Clarence C.; and Leonard, Charles R., 4,117,801, Cl. 118-20.000.
Easy Riser, Inc.: *See—*
Gessler, Robert U., 4,117,999, Cl. 248-188.200.
Ebauches S.A.: *See—*
Laesser, Claude, 4,118,111, Cl. 350-334.000.
Saurer, Eric; and Laesser, Claude, 4,118,110, Cl. 350-334.000.
Ebner, Peter R.; and Griffith, Louis E., to Itek Corporation. Font support assembly for a phototypesetting machine. 4,118,711, Cl. 354-15.000.
Eckel, Leonard B.; Sullivan, James P.; and Quintana, Elias D., to Design West Incorporated. Modular storage unit. 4,117,783, Cl. 108-91.000.
Eckert, Lewis W.; Nikolaus, Harold W.; and Ollinger, James C., to Armstrong Cork Company. Ceiling panel attachment clip. 4,117,642, Cl. 52-486.000.
Economu, Merle A., to United States of America, National Aeronautics and Space Administration. Wire stripper. 4,117,749, Cl. 81-9.50R.
Edstrom, Kjell: *See—*
Nilsson, Goran Alfred; Edstrom, Kjell; and Wiklund, Henry, 4,117,764, Cl. 91-50.000.
Egli, Alwin, to Sig Schweizerische Industrie-Gesellschaft. System for forming, filling and closing bags. 4,117,649, Cl. 53-558.000.
EIC Corporation: *See—*
Koch, Victor R., 4,118,550, Cl. 429-194.000.
Eichelburg, Robert J. Yeast hydrolyzate oral ingesta for animals. 4,118,512, Cl. 424-359.000.
Eidt, Scott H.; Watson, Spencer C.; and Heilig, George Charles, to Texas Alkyls, Inc. Process for the simultaneous production of trimethylaluminum and alkylaluminum halides. 4,118,409, Cl. 260-448.00A.
Ekdahl, Paul. Pot holding arm support. 4,117,629, Cl. 47-67.000.

Electroschmelzwerk Kempten GmbH: *See*—
Schmitt-Thomas, Karlheinz G.; Lipp, Alfred; and Schwetz, Karl, 4,118,256, Cl. 148-160.000.
Eli Lilly and Company: *See*—
Beck, James Richard; and Gajewski, Robert Peter, 4,118,574, Cl. 548-363.000.
Paget, Charles J.; and Wikel, James H., 4,118,573, Cl. 548-306.000.
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., 4,118,742, Cl. 548-306.000.
Elliesen, Wolfgang, to Joh. Friedrich Behrens Aktiengesellschaft. Compressed air-operated fastener driver. 4,117,767, Cl. 91-461.000.
Elliott Brothers (London) Limited: *See*—
Sarson, Alan Elmer; and Clark, William James Rowley, 4,118,733, Cl. 358-109.000.
Ellis, Delmar H., to General Electric Company. Composite reinforcement of metallic airfoils. 4,118,147, Cl. 416-230.000.
Ellsworth, Clayton S. Method of mixing fertilizer. 4,118,798, Cl. 366-156.000.
Elmore, Marion Edward; and Klang, James Kenneth, to Gould Inc. Process for recycling junk lead-acid batteries. 4,118,219, Cl. 75-103.000.
Elsaesser, Fred L.; and Hall, Joseph H., to United Technologies Corporation. Stall detector for gas turbine engine. 4,117,668, Cl. 60-39.030.
Elwart, Jan: *See*—
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Emhart Industries, Inc.: *See*—
Alexander, Gordon A., 4,118,056, Cl. 292-169.170.
EMI Limited: *See*—
Froggatt, Robert Justin, 4,118,631, Cl. 250-492.00R.
Hounsfield, Godfrey Newbold, 4,118,628, Cl. 250-445.00T.
Hounsfield, Godfrey Newbold, 4,118,629, Cl. 250-445.00T.
Energy and Minerals Research Co.: *See*—
Tarpley, William B., Jr., 4,118,797, Cl. 366-127.000.
Engelhard Minerals & Chemicals Corporation: *See*—
Flanagan, Paul; Norster, Eric Roy; Carrubba, Robert V.; and Heck, Ronald M., 4,118,171, Cl. 431-10.000.
Hamill, Herbert R.; and Potts, David E., 4,118,245, Cl. 106-288.00B.
Horzepa, John P.; and Potts, David E., 4,118,246, Cl. 106-288.00B.
Marchetti, Francis R.; Zentz, William E.; and Berube, Richard R., 4,118,247, Cl. 106-308.00N.
Engelhardt, Gudrun, administrator: *See*—
Determann, Helmut; Bernt, Erich; Dollacker, Werner; Gutmann, Ingeborg, deceased; and Engelhardt, Gudrun, administrator, 4,118,279, Cl. 195-63.000.
Engels, Kaspar, to Draiswerke GmbH. Stirring mill. 4,117,981, Cl. 241-46.150.
Engels, Walter, to Milliken Research Corporation. Selvedge detector and guide. 4,117,576, Cl. 26-9.000.
Engels, Walter: *See*—
Gilpatrick, Michael William; and Engels, Walter, 4,117,577, Cl. 26-9.000.
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Epstein, Joseph William, to American Cyanamid Company. Process for resolving cis-1-substituted phenyl-1,2-cyclopropanedicarboxylic acids. 4,118,417, Cl. 562-401.000.
Epstein, Martin: *See*—
Casey, Donald James; and Epstein, Martin, 4,118,470, Cl. 424-19.000.
Erba, Carlo: *See*—
Giraldi, PierNicola; Nannini, Giuliano; Logemann, Willy; Tommasini, Raffaele; Buttinoni, Ada; and Biasoli, Giovanni, 4,118,504, Cl. 424-274.000.
Erikson, Uno Eugen, to Siemens-Elema AB. Catheter for selective coronary arteriography of the left coronary artery. 4,117,836, Cl. 128-2.05R.
Eriksson, Jan-Christer; Larsson, Rolf; Rosengren, Ake; and Hjelte, Maj-Britt, to Aminkemi Aktiebolag. Non-thrombogenic medical article and a method for its preparation. 4,118,485, Cl. 424-183.000.
Ernst, Alfons: *See*—
Kober, Hans-Rudolf; and Ernst, Alfons, 4,117,601, Cl. 33-172.00E.
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. Linear ball bearing including longitudinal slot in the sleeve with ball-retaining cage. 4,118,078, Cl. 308-6.00C.
Ernst Leitz Wetzlar GmbH: *See*—
Klemm, Reinhart, 4,118,659, Cl. 318-560.000.
Leiter, Herbert; and Reinheimer, Gunter, 4,118,719, Cl. 354-79.000.
Erskine, Clive Arnold, to ACI Technical Centre Pty Ltd. Clay compositions. 4,118,236, Cl. 106-71.000.
Erwin Kampf Maschinenfabrik, Firma: *See*—
Hutzenlaub, Armin, 4,117,986, Cl. 242-56.200.
Essel, Alain Jacques: *See*—
Graveron, Bernard Jacques; and Essel, Alain Jacques, 4,118,258, Cl. 156-60.000.
Ethyl Corporation: *See*—
Nelson, Gunner E., 4,118,404, Cl. 260-404.000.
Ettel, Victor Alexander; and Devuyst, Eric August Pierre, to International Nickel Company, Inc., The. Copper recovery from sulfate solutions containing nickel and cobalt. 4,118,221, Cl. 75-108.000.
Euker, Charles A., Jr.: *See*—
Eakman, James M.; Nahas, Nicholas C.; and Euker, Charles A., Jr., 4,118,204, Cl. 48-197.00R.
Euteco, S.p.A.: *See*—
Vargiu, Silvio; Carpaneti, Edoardo; Crespolini, Giancarlo; and Pitzalis, Mario, 4,118,555, Cl. 526-76.000.
Eutectic Corporation: *See*—
Knotek, Otto; Lugscheider, Erich; and Wichert, Wolfgang, 4,118,254, Cl. 148-32.000.
Patel, Mahesh S., 4,118,527, Cl. 427-423.000.
EVG Entwicklungs- u. Verwertungs-GmbH.: *See*—
Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,117,872, Cl. 140-57.000.
Exler, Petrus Andre Theodorus; and Lobbe, Johannes, to Pakhoed-Rotterdam B.V. Climate-control unit particularly for incorporation in a container. 4,118,209, Cl. 62-176.00D.
Exxon Research & Engineering Co.: *See*—
Brenner, Douglas, 4,118,359, Cl. 260-30.80R.
Eakman, James M.; Nahas, Nicholas C.; and Euker, Charles A., Jr., 4,118,204, Cl. 48-197.00R.
Goldstein, Melvin; and Tyler, William E., III, 4,118,414, Cl. 260-467.000.
Lundberg, Robert D., 4,118,361, Cl. 260-31.80G.
Makowski, Henry S.; and O'Farrell, Charles P., 4,118,353, Cl. 260-28.50B.
Makowski, Henry S.; and O'Farrell, Charles P., 4,118,360, Cl. 260-31.20R.
Makowski, Henry S.; and Brenner, Douglas, 4,118,362, Cl. 260-32.60A.
Fabbrica Italiana Magneti Marelli S.p.A.: *See*—
Huwyler, Franco, 4,118,638, Cl. 307-11.000.
Fabio, Paul Frank: *See*—
Lang, Stanley Albert, Jr.; Fabio, Paul Frank; Lin, Yang-I; Murdock, Keith Chadwick; and Fields, Thomas Lynn, 4,118,498, Cl. 424-267.000.
Fabrication Belge de Disques "Fabeldis": *See*—
Dewallens, Leon, 4,118,287, Cl. 204-6.000.
Factor, Arnold: *See*—
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Fahey, Darryl R.; and Mahan, John E., to Phillips Petroleum Company. Organophosphorus nickel complexes and preparation thereof. 4,118,408, Cl. 260-439.00R.
Fairchild Camera and Instrument Corporation: *See*—
Berry, Robert, 4,118,728, Cl. 357-22.000.
Rinaldo, Kenneth D., 4,118,757, Cl. 361-404.000.
Falk, Edward J., to Wagner Electric Corporation. Tandem master cylinder with integral proportioning valve. 4,117,681, Cl. 60-562.000.
Falkenhain, Wilhelm; and Feder, Ernst, to Dynamit Nobel Aktiengesellschaft. Chemically removing iron from grits. 4,118,459, Cl. 423-142.000.
Fancher, Llewellyn, to Stauffer Chemical Company. 2,4-Dichlorophenoxyacetyl carbamate hydrazides useful as herbicides. 4,118,576, Cl. 560-29.000.
Fanshawe, William Joseph; Safir, Sidney Robert; and Crawley, Lantz Stephen, to American Cyanamid Company. Phenyl azabicycloheXanones. 4,118,393, Cl. 260-326.50B.
Farina, Attilio. Circuit arrangement for providing a saw-tooth current in a coil. 4,118,657, Cl. 315-408.000.
Farmer, Alan Charles: *See*—
Cockett, Stewart Graham; Taylor, Jeffrey Philip; Craven, Peter; and Farmer, Alan Charles, 4,118,790, Cl. 364-900.000.
Farmland Industries, Incorporated: *See*—
Oestreicher, Stephen L.; and Hardin, David P., 4,118,217, Cl. 71-92.000.
Favale, Renato: *See*—
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Fawcett, Sherwood L.; and Anno, James N., to Battelle Development Corporation. Heat pump. 4,117,696, Cl. 62-115.000.
Fay, Clifford C.: *See*—
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Federal-Mogul Corporation: *See*—
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Ladin, Eli M.; and Reynolds, Mark P., 4,117,917, Cl. 192-98.000.
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Growney, Lawrence J., 4,117,924, Cl. 206-45.140.
Fedulaev, Vitaly Pavlovich: *See*—
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Zjukin, Nikolai Stepanovich; Kostjuk, Boris Dmitrievich; Shaikevich, Stanislava Stanislavovna; Motsak, Yaroslav Feodosievich; Fedulaev, Vitaly Pavlovich; Kolchemanov, Nikolai Alexandrovich; Ugarov, Valentin Mikhailovich; Losev, Viktor Vasilievich; Drui, Mark Simonovich; Lavrinovich, Alla Alexandrovna; Shpotakovsky, Dmitry Fedorovich; and Chizhov, Stanislav Viktorovich, 4,117,968, Cl. 228-124.000.
Feess, Erich; Springer, Hartmut; and Gronen, Willy, to Hoechst Aktiengesellschaft. Process for the fixation of organic dyestuffs on materials having a fibrous structure. 4,118,186, Cl. 8-49.000.
Feldmann, William F. Heat retriever. 4,117,883, Cl. 165-174.000.
Felix, Bernd: *See*—
Semmler, Hans-Joachim; and Felix, Bernd, 4,118,290, Cl. 204-59.00F.

Fenestra: *See*—
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Fennell, John C. Ornamental light arrangement. 4,118,762, Cl. 362-311.000.

Ferguson, Ronald Worden: *See*—
Rayfield, Wilson Parker; Ferguson, Ronald Worden; and Brooks, George Mahue, 4,118,022, Cl. 270-52.500.

Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., to Ayerst, McKenna & Harrison Limited. Aryloxy aminobutanols for alleviating symptoms of depression. 4,118,511, Cl. 424-330.000.

Ferranti Limited: *See*—
Crawford, Ian Drummond; Marshall, Henry Bruce; and Cormack, Robert John, 4,118,109, Cl. 350-285.000.
Kerr, Andrew Guy; and Morley, Robert Arthur, 4,118,012, Cl. 254-173.00R.

Fertl, Walter H.; and Gant, Preston L., to Continental Oil Company. Continuous quality control of mined hard and soft coals. 4,118,623, Cl. 250-253.000.

Fibus, C. Kenneth, to Steel City Corporation, The. Wall mounted tool cabinet. 4,118,085, Cl. 312-245.000.

Fields, Joseph E.; and Slocombe, Robert J., to Monsanto Company. Aggregated polyelectrolytes. 4,118,554, Cl. 526-15.000.

Fields, Paul. Electrical trouble finding apparatus. 4,118,664, Cl. 324-51.000.

Fields, Thomas Lynn: *See*—
Lang, Stanley Albert, Jr.; Fabio, Paul Frank; Lin, Yang-I; Murdock, Keith Chadwick; and Fields, Thomas Lynn, 4,118,498, Cl. 424-267.000.

Filtrox Maschinenbau A.G.: *See*—
Strub, Fritz, 4,118,778, Cl. 364-502.000.

Filzinger, Klaus: *See*—
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Firing Circuits Inc.: *See*—
Salva, John P.; Mudzinski, Gregory M.; Mills, John A.; and Dewan, Shashi B., 4,118,658, Cl. 318-257.000.

Firmenich, S.A.: *See*—
Skorianetz, Werner; and Ohloff, Gunther, 4,118,343, Cl. 252-522.000.

Fisher, Denys. Drawing instrument or apparatus. 4,117,598, Cl. 33-27.00L.

Fisher-Klosterman, Inc.: *See*—
Hagendoorn, Willem Jacob, 4,118,206, Cl. 55-74.000.

Fitchett, Arthur B. Bag alarm device. 4,118,692, Cl. 340-542.000.

Flambeau Products Corporation: *See*—
Kneier, Joseph William, 4,118,086, Cl. 312-270.000.

Flanagan, Paul; Norster, Eric Roy; Carrubba, Robert V.; and Heck, Ronald M., to Engelhard Minerals & Chemicals Corporation. Method for effecting sustained combustion of carbonaceous fuel. 4,118,171, Cl. 431-10.000.

Fleischer, Helmut; and Schneider, Erich, to Robert Bosch GmbH. Vehicle speed control system. 4,117,903, Cl. 180-105.00E.

Fleming, Francis William; and Pethick, Raymond John, to Markon Engineering Company Limited. Electromagnetic machines. 4,118,646, Cl. 310-58.000.

Fletcher Sutcliffe Wild Limited: *See*—
Scarfe, Arthur; and Smith, John Cambridge, 4,117,687, Cl. 405-292.000.

Fluester, James, to Spiralux Limited. Blind riveting tools. 4,117,710, Cl. 72-391.000.

FMC Corporation: *See*—
Berkowitz, Sidney, 4,118,569, Cl. 544-190.000.
McKeon, John F., 4,117,738, Cl. 74-250.00R.
Michaely, William James, 4,118,400, Cl. 260-340.500.

Fohl, Artur, to REPA Feinstanzwerk GmbH. Swinging fitting for safety belts in motor vehicles. 4,118,068, Cl. 297-385.000.

Formica Corporation: *See*—
Power, George Edward; and Bolling, Donald Louis, 4,118,541, Cl. 428-452.000.

Formica, Joseph V.: *See*—
Apple, Martin A.; and Formica, Joseph V., 4,118,482, Cl. 424-177.000.

Forsten, Herman Hans, to Du Pont de Nemours, E. I., and Company. Process for heat treating a needled batt. 4,117,578, Cl. 28-112.000.

Foster, F. Gordon: *See*—
Mc Partland, Richard J.; Foster, F. Gordon; and Kupfer, David J., 4,117,834, Cl. 128-2.00S.

Foster, Gene B., to Boeing Company, The. Rolling machines for contouring tapered structural members. 4,117,702, Cl. 72-7.000.

Foster Wheeler Limited: *See*—
Nickerson, James H. D.; and Steel, Robert R., 4,117,885, Cl. 165-176.000.

Foundation: The Research Institute For Special Inorganic Materials, The: *See*—
Asada, Chiaki; Kusaka, Katsushi; and Kajima, Hisashi, 4,117,565, Cl. 75-204.000.

Fouquet, Gerd; Merger, Franz; Platz, Rolf; and Baer, Karl, to BASF Aktiengesellschaft. Manufacture of methacrylic acid and methyl methacrylate. 4,118,588, Cl. 560-210.000.

Fournie, Rene, to Societe Nationale Elf Aquitaine (Production). Placing conduits on the sea floor by hauling and controlled immersion. 4,117,693, Cl. 405-171.000.

Fowler, Arnold L.: *See*—
Johnson, James H.; Fowler, Arnold L.; Brooks, Julius E.; and Friend, Harvey H., 4,117,761, Cl. 89-129.00B.

Fram Corporation: *See*—
Cook, John E., 4,117,724, Cl. 73-386.000.

Francis, Gaylord Lee; and Morelli, Amedeo John, to North American Philips Corporation. Method of manufacturing a hermetically sealed electronic component. 4,117,589, Cl. 29-619.000.

Franke, Raymond C., to Westinghouse Air Brake Company. Locomotive speed control apparatus. 4,118,774, Cl. 364-431.000.

Franklin, Kevin T.: *See*—
Cooke, Gordon R.; and Franklin, Kevin T., 4,118,709, Cl. 346-33.00R.

Franklin, Walter M.: *See*—
Trist, Nicolas P.; Guffin, Robert E.; Franklin, Walter M.; Crosby, James B., Jr.; Hallaway, Glen N.; and Tellier, James G., 4,117,597, Cl. 32-27.000.

Frantsits, Werner J. Method for the production of indolyl lactones. 4,118,395, Cl. 260-326.290.

Franz Volkl oHG: *See*—
Schnurrenberger, Hermann, 4,118,050, Cl. 280-604.000.

Fraser, Alan S.: *See*—
United States of America, National Aeronautics and Space Administration; Fraser, Alan S.; Wells, Arthur F.; and Tenoso, Harold J., 4,118,315, Cl. 210-23.00F.

Fray, Derek John; and Cleland, James Henry, to National Research Development Corporation. Packed bed electrorefining and electrolysis. 4,118,292, Cl. 204-67.000.

Frayer, James Albert; Lese, Henri K.; McKinney, Joel Drexler; Metzer, Kirk J.; and Paraskos, John Angelo, to Gulf Research & Development Company. Hydrodesulfurization process employing a guard reactor. 4,118,310, Cl. 208-210.000.

Fredd, John V., to Otis Engineering Corporation. Thread chaser tool for contiguous straight and tapered thread runs. 4,117,563, Cl. 10-101.00R.

Freeman, Michael J.: *See*—
Kurland, Lawrence G.; and Freeman, Michael J., 4,117,605, Cl. 35-9.00A.

Frei, Willi, to Air Frohlich AG fur Energie-Ruckgewinnung. Tubular heat exchanger and process for its manufacture. 4,117,884, Cl. 165-175.000.

French, Gordon B.; and Ridley, Richard D., to Occidental Oil Shale, Inc. Subterranean in situ oil shale retort and method for making and operating same. 4,118,070, Cl. 299-2.000.

French Oil Mill Machinery Company, The: *See*—
Hunt, Arthur J., 4,117,776, Cl. 100-117.000.

Friddle, William D., Jr.: *See*—
Friddle, William D., Sr.; Friddle, William D., Jr.; and O'Steen, Wilbourne D., 4,117,753, Cl. 83-143.000.

Friddle, William D., Sr.; Friddle, William D., Jr.; and O'Steen, Wilbourne D. Sheet cutting apparatus. 4,117,753, Cl. 83-143.000.

Friedel, Franz Lutz; Schone, Armin; and Reuter, Franz Gottfried, to Gottfried Reuter GmbH i.L. Polyphenyl-polymethylene-polyisocyanate mixtures. 4,118,410, Cl. 260-453.0AM.

Friedel, William C., Jr.; and Dietz, Charles F., to University of California, The Regents of the. Tomato harvesting sorting system. 4,118,311, Cl. 209-75.000.

Friend, Harvey H.: *See*—
Johnson, James H.; Fowler, Arnold L.; Brooks, Julius E.; and Friend, Harvey H., 4,117,761, Cl. 89-129.00B.

Frigitemp Corporation: *See*—
Androulakis, John G., 4,117,947, Cl. 220-435.000.

Frisby, Reg Alan, to TRW Inc. Electrical connection assemblies. 4,118,091, Cl. 339-14.00R.

Friswell, David R.; and Hutchins, Burleigh M. Bubble sensor and method. 4,117,727, Cl. 73-422.0GC.

Fritsch, Thomas R.; and Anderson, Mark C., to UOP Inc. Production and recovery of para-xylene. 4,118,429, Cl. 260-674.0SA.

Froehlich, Alfred: *See*—
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,118,232, Cl. 96-99.000.

Froggatt, Robert Justin, to EMI Limited. Radiographic apparatus. 4,118,631, Cl. 250-492.00R.

From, Charles A., Jr.: *See*—
Bassett, Henry C.; From, Charles A., Jr.; Parker, John F.; and Worley, Ansel A., 4,118,596, Cl. 174-87.000.

Frye, Hal W.: *See*—
Allen, Royce H.; Sutton, Jerry L.; Griffin, Dan M.; Frye, Hal W.; and Colborn, Joseph G., 4,118,782, Cl. 364-565.000.

Frye, Robert Charles; Katz, Alan Harry; and Hewes, Charles Robert, to Texas Instruments Incorporated. Two-phase CCD regenerator - I/O circuits. 4,118,795, Cl. 365-222.000.

Fuchs, Heribert, to Ruthner Industrieanlagen-Aktiengesellschaft. System for feeding solutions and suspensions. 4,117,978, Cl. 239-112.000.

Fuchs, Hermann; and Filzinger, Klaus, to Hoechst Aktiengesellschaft. 1:2 Cobalt complex phenol-acetoacetanilide benzene disazo dyestuffs. 4,118,381, Cl. 260-148.000.

Fuchs, Otto; and Kroh, Adolf, to Hoechst Aktiengesellschaft. Naphthalimide-4,5-dicarboxylic acids. 4,118,387, Cl. 260-281.00A.

Fuji Photo Film Co., Ltd.: *See*—
Ohta, Takahiro; and Muramatsu, Akira, 4,118,654, Cl. 40-361.000.

Fuji Xerox Co., Ltd.: *See*—
Yamada, Yasuo; and Seki, Masao, 4,118,104, Cl. 350-3.600.

Fujimori, Yoshiaki: *See*—
Miyasaka, Tsutomu; Fujimori, Yoshiaki; Matsui, Shigeru; and Komaki, Tetsuo, 4,117,658, Cl. 58-90.00R.

Fukuba, Kiyohide, to Japan Storage Battery Company Limited. Method for interconnecting adjacent electric storage batteries. 4,117,969, Cl. 228-140.000.

Fukuda, Yoshiharu; Ohtani, Kazumasa; Onissi, Tossio R.; and Takeuchi, Akitoshi, to Onoda Cement Company, Limited. Apparatus for calcining wet powdery gypsum. 4,118,196, Cl. 422-232.000.
Fukushima, Mitsuru: *See—*
Morishita, Masataka; Yokokawa, Yasuo; Nishikawa, Tokio; Mishiro, Masahiro; Ohashi, Shigeyasu; Fukushima, Mitsuru; Inaba, Yoshihito; and Matsuda, Tetsuo, 4,118,336, Cl. 252-316.000.
Fuller Company: *See—*
Solt, Paul E., 4,118,074, Cl. 302-26.000.
Fuller, Lawrence W.; and Hawley, E. Dale. Novel field crop-thinning apparatus and method. 4,117,888, Cl. 172-1.000.
Funabashi, Katsunori; and Kohyama, Mikihiro, to Honda Giken Kogyo Kabushiki Kaisha. Air sucking device for engines. 4,117,823, Cl. 123-198.00E.
Funakoshi, Hisashi: *See—*
Ban, Itsuki; Iizuka, Shohei; and Funakoshi, Hisashi, 4,118,743, Cl. 360-73.000.
Fung, Paul J., to Premier Cablevision, Limited; and National Cablevision, Limited. Remote disconnect-reconnect tap for cable television systems. 4,118,669, Cl. 325-309.000.
Furusawa, Choji: *See—*
Murakami, Noboru; and Furusawa, Choji, 4,117,677, Cl. 60-345.000.
Fusaroli, Goffredo, to S.A.M.P.R.E. S.p.A. Drawing frame with a belt control system, for spinning frames. 4,117,572, Cl. 19-244.000.
Futamura, Kazumasa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seal structure. 4,118,041, Cl. 277-180.000.
G. Siempelkamp GmbH & Co.: *See—*
Gerhardt, Klaus, 4,118,024, Cl. 271-5.000.
Gabus, Jean-Claude, to Carba S.A. Control device for operation by the mouth of a handicapped person. 4,117,863, Cl. 137-601.000.
Gabus, Jean-Claude, to Carba S.A. Actuating device for an invalid of plural electrical control circuits. 4,118,612, Cl. 200-81.90R.
GAF Corporation: *See—*
Ziegler, Bertram Randall; and Matteson, Edward J., 4,118,272, Cl. 162-156.000.
Gaffar, Abdul; and Niles, Hollandra P., to Colgate-Palmolive Company. Antibacterial oral composition. 4,118,472, Cl. 424-54.000.
Gaffar, Abdul; and Niles, Hollandra P., to Colgate-Palmolive Company. Antibacterial oral composition. 4,118,473, Cl. 424-54.000.
Gaffar, Abdul; and Niles, Hollandra P., to Colgate-Palmolive Company. Antibacterial oral composition. 4,118,474, Cl. 424-54.000.
Gaffar, Abdul; and Niles, Hollandra P., to Colgate-Palmolive Company. Antibacterial oral composition. 4,118,475, Cl. 424-54.000.
Gaffar, Abdul; and Niles, Hollandra P., to Colgate-Palmolive Company. Antibacterial oral composition. 4,118,476, Cl. 424-54.000.
Gagin, Lawrence Vincent, to Johns-Manville Corporation. Alkali-resistant glass fiber composition. 4,118,239, Cl. 106-50.000.
Gajewski, Robert Peter: *See—*
Beck, James Richard; and Gajewski, Robert Peter, 4,118,574, Cl. 548-363.000.
Gamperdona Handels- und Finanz Aktiengesellschaft: *See—*
Hoop, William J., 4,118,082, Cl. 312-59.000.
Ganellin, Charon Robin: *See—*
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,118,496, Cl. 424-263.000.
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,118,502, Cl. 424-273.00R.
Gant, Preston L.: *See—*
Fertl, Walter H.; and Gant, Preston L., 4,118,623, Cl. 250-253.000.
Gard, Leslie H.: *See—*
United States of America, National Aeronautics and Space Administration; Wall, William A., Jr.; Ives, Robert E.; Bruce, Miles Melvin, Jr.; Pryor, Peter Paul, Jr.; and Gard, Leslie H., 4,118,620, Cl. 219-124.320.
Gardano, Andrea: *See—*
Cassar, Luigi; and Gardano, Andrea, 4,118,589, Cl. 560-204.000.
Gauthier, Francis; and Mignien, Georges, to Les Cables de Lyon. Device for welding optical fibres end to end. 4,118,618, Cl. 219-121.00P.
Gebruder Kommerling Kunststoffwerke G.m.b.H.: *See—*
Vogel, Karl Heinz, 4,118,267, Cl. 156-293.000.
Gehrung, Manfred: *See—*
Wittkamp, Heinrich; and Gehrung, Manfred, 4,118,616, Cl. 206-387.000.
Geiger, Julius: *See—*
Klein, Hans-Joachim; Rupprecht, Manfred; Wonneberg, Heinz; Geiger, Julius; and Masa, Gunter, 4,118,127, Cl. 356-200.000.
Geiger, Rolf: *See—*
Konig, Wolfgang; Geiger, Rolf; and Sandow, Jurgen, 4,118,483, Cl. 424-177.000.
Geise, Philip E., Jr.: *See—*
United States of America, National Aeronautics and Space Administration; Brey, Hans; and Geise, Philip E., Jr., 4,118,701, Cl. 343-6.00R.
Genequand, Pierre: *See—*
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General Dynamics Corporation: *See—*
Holland, Charles L.; and Coulson, John N., Jr., 4,117,943, Cl. 214-6.00D.
General Electric Company: *See—*
Banucci, Eugene G.; and Boldebuck, Edith M., 4,118,535, Cl. 428-383.000.
Barkan, Philip; and Imam, Imdad, 4,118,613, Cl. 200-82.00B.
Bennett, James G.; Cooper, Glenn D.; and Katchman, Arthur, 4,118,348, Cl. 260-4.0AR.
Coppa, Anthony Patrick; and Zauderer, Bert, 4,118,643, Cl. 310-11.000.
Corsmeier, Robert J.; and Brown, Richard N., 4,118,136, Cl. 403-386.000.
Cusano, Dominic A.; and Webster, Harold F., 4,118,758, Cl. 362-6.000.
Ellis, Delmar H., 4,118,147, Cl. 416-230.000.
Osteen, Mitchell M., 4,118,763, Cl. 362-339.000.
Peil, William, 4,118,689, Cl. 340-629.000.
Sannes, Keith N.; and Factor, Arnold, 4,118,370, Cl. 260-45.75W.
Shaw, David G.; and Shedigian, Vandos, 4,117,579, Cl. 29-25.420.
General Instrument Corporation: *See—*
Hiday, David R.; and Larsen, Charles G., 4,118,679, Cl. 334-1.000.
General Signal Corporation: *See—*
Auer, John H., Jr.; and Sibley, Henry C., 4,118,750, Cl. 361-182.000.
Right, Robert W., 4,118,694, Cl. 340-293.000.
Genge, Bruce I.: *See—*
Current, Wayne A.; Genge, Bruce I.; Hurme, Herbert J.; and Zocher, Josef, 4,117,791, Cl. 112-222.000.
Georgiev, Georgi Dimitrov: *See—*
Petrov, Georgi Mitev; Andonov, Blagoy Alexandrov; Trayanov, Svetozar Paissiev; and Georgiev, Georgi Dimitrov, 4,117,654, Cl. 57-19.000.
Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, to Hoffmann-La Roche Inc. Dibenz(b,f)oxepin derivatives. 4,118,572, Cl. 544-369.000.
Gerhards, Hermann: *See—*
Kunstmann, Rudolf; Lerch, Ulrich; and Gerhards, Hermann, 4,118,497, Cl. 424-267.000.
Gerhardt, Klaus, to G. Siempelkamp GmbH & Co. Apparatus for handling facing sheets for the production of pressed board and other laminates. 4,118,024, Cl. 271-5.000.
Gessler, Robert U., to Easy Riser, Inc. Furniture leg extenders. 4,117,999, Cl. 248-188.200.
Gibbs, Stephen R., to Burroughs Corporation. Apparatus for chemically treating a single side of a workpiece. 4,118,303, Cl. 204-224.00R.
Gibson, Bruce Douglas: *See—*
Simonsen, John; Gibson, Bruce Douglas; and Gruner, Heinz Walter, 4,117,720, Cl. 73-194.0EM.
Gibson-Homans Company, The: *See—*
Slywka, Michael, 4,117,982, Cl. 241-51.000.
Gill, Gary. Mathematics teaching system. 4,117,607, Cl. 35-31.00R.
Gillet, Roger; and Allegre, Jean, to Societe Generale de Constructions Electriques et Mecaniques Alsthom. Salient pole of a synchronous electric machine. 4,118,648, Cl. 310-269.000.
Gillingham, Alan George Albert: *See—*
Bingham, Kenneth Charles Arthur; Gillingham, Alan George Albert; and Baldwin, Colin, 4,118,523, Cl. 427-97.000.
Gilpatrick, Michael William; and Engels, Walter, to Milliken Research Corporation. Method to protect fabric selvedge on loop pile cutting machine. 4,117,577, Cl. 26-9.000.
Giraldi, PierNicola; Nannini, Giuliano; Logemann, Willy; Tommasini, Raffaele; Buttinoni, Ada; and Biasoli, Giovanni, to Erba, Carlo. Isoindoline derivatives for treating pain. 4,118,504, Cl. 424-274.000.
Gitzendanner, Louis G., to Honeywell Information Systems Inc. Motor isolation mount for disk drives. 4,117,997, Cl. 248-20.000.
Glace, William Richard: *See—*
Ibsen, Robert L.; and Glace, William Richard, 4,117,595, Cl. 32-8.000.
Glattli, Alfred: *See—*
Stromberger-D'Alton-Rauch, Ilse-Dore; Klose, Karl; Bergmann, Udo; Glattli, Alfred; and Hodum, Claus-Peter, 4,118,229, Cl. 96-27.00H.
Glaxo Laboratories Limited: *See—*
Stephenson, Leslie; and Smith, Colin, 4,118,499, Cl. 424-267.000.
Glennon, Timothy F., to Sundstrand Corporation. Confidence check circuit for built-in test systems. 4,118,688, Cl. 340-516.000.
Global Marine, Inc.: *See—*
Sjogren, Charles Norman, 4,117,794, Cl. 114-40.000.
Globe-Union, Inc.: *See—*
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Gnadig, Gerhard; and Seufert, Wilhelm, to Werner & Pfleiderer. Method of providing a wear-resistant lining in the work chamber of a screw extruder. 4,117,583, Cl. 29-447.000.
Gobert, Robert R., to National Steel Corporation. Cathode structure for use in electrolytic process. 4,118,302, Cl. 204-206.000.
Godau, Eckhardt; and Schneider, Max, to Quikoton AG. Process for the treatment of warp yarns. 4,118,183, Cl. 8-18.00R.
Godin, Gilbert; and Norgard, Fred C., to Johns-Manville Corporation. Manufacture of perlite insulating board on a cylinder machine. 4,118,273, Cl. 162-171.000.
Goebel, Franz, to GTE Laboratories Incorporated. Primary electrochemical cell. 4,118,334, Cl. 252-182.100.
Goehring, Daniel: *See—*
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Goell, James E.; and Brandt, H. David, to International Telephone and Telegraph Corporation. Optical couplers for light emitting diodes and detectors. 4,118,100, Cl. 350-96.200.
Goings, Richard L.: *See—*
Braund, Darwin G.; Dolge, Kendall L.; Goings, Richard L.; and Steele, Robert L., 4,118,513, Cl. 426-2.000.

Golar-Nor Offshore A/S: *See—*
McCleskey, Robert W., Jr.; Putnam, Paul S.; and Boltad, Arne Martin, 4,117,941, Cl. 214-2.500.

Golas, Eugene A.; and Singh, Shri N., to United States Steel Corporation. Method and single piece annular nozzle to prevent alumina buildup during continuous casting of al-killed steel. 4,117,959, Cl. 222-590.000.

Goldstein, Melvin; and Tyler, William E., III, to Exxon Research & Engineering Co. Difluoramino compounds and perfluoroguanidinepentaerythrityl nitrates. 4,118,414, Cl. 260-467.000.

Goldstein, Norman P.; and Todt, William H., to Westinghouse Electric Corp. Gamma flux responsive self-powered radiation detector. 4,118,626, Cl. 250-370.000.

Goldstein, Stephen L.; and Babiec, John S., Jr., to Olin Corporation. Process for preparing dihydroxytoluene. 4,118,586, Cl. 568-767.000.

Gole, Jean: *See—*
Graveron, Bernard Jacques; and Essel, Alain Jacques, 4,118,258, Cl. 156-60.000.

Golosov, Viktor Nikolaevich: *See—*
Burin, Viktor Leontievich; Tjutjunnikov, Anatoly Borisovich; Golosov, Viktor Nikolaevich; Tarynin, Evgeny Konstantinovich; Pogorely, Nikolai Pavlovich; and Lukyanenko, Vladimir Matveevich, 4,118,446, Cl. 261-114.0VT.

Gomi, Hiroshi; and Taguchi, Shinichiro, to Tokyo Shibaura Electric Co., Ltd. Hue adjusting circuits. 4,118,741, Cl. 358-28.000.

Gomolak, Theodore M., to Johnstons & Associates, Inc. Viewing panel for producing multiple images of a design. 4,117,615, Cl. 40-363.000.

Gonda, Richard: *See—*
Cimetiere, Louis; and Gonda, Richard, 4,117,880, Cl. 164-433.000.

Goodman, James A. Automatic collator. 4,117,648, Cl. 53-537.000.

Goodson, Louis H.; and Jacobs, William B., to Midwest Research Institute. Method and apparatus for continuously extracting trace contaminants from air and monitoring the contaminant content thereof. 4,117,714, Cl. 73-23.000.

Gordon, Lee: *See—*
Ward, Nazareen, 4,117,805, Cl. 119-5.000.

Gorski, Anthony J.: *See—*
Graven, Robert M.; Gorski, Anthony J.; Schertz, William W.; and Graae, Johan E. A., 4,118,249, Cl. 136-89.0PC.

Goshima, Yoshio; and Osada, Hisashi, to TDK Electronics Co., Ltd. Coil retaining case. 4,118,678, Cl. 333-70.00S.

Gothsche, Friedrich, to Motoren- und Turbinen-Union Munchen GmbH. Gas turbine container. 4,117,927, Cl. 206-319.000.

Goto, Masuo: *See—*
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Gotoh, Miyuki, to Nissan Motor Company, Limited. Weft yarn sensor. 4,117,870, Cl. 139-370.200.

Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, to EVG Entwicklungs- u. Verwertungs-GmbH. Binding tool. 4,117,872, Cl. 140-57.000.

Gottfried Reuter GmbH i.L.: *See—*
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Gottschalk, Robert E., to Panavision, Incorporated. Viewfinder eyepiece leveling device. 4,118,720, Cl. 354-81.000.

Gould Inc.: *See—*
Duggan, J. E., 4,118,754, Cl. 361-355.000.
Elmore, Marion Edward; and Klang, James Kenneth, 4,118,219, Cl. 75-103.000.
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Graae, Johan E. A.: *See—*
Graven, Robert M.; Gorski, Anthony J.; Schertz, William W.; and Graae, Johan E. A., 4,118,249, Cl. 136-89.0PC.

Grabmaier, Josef: *See—*
Aulich, Hubert; and Grabmaier, Josef, 4,118,212, Cl. 65-3.00A.

Grahn, Per Goran, to Kommanditbolaget United Stirling (Sweden) AB & Co. Hot gas engine heater head. 4,117,679, Cl. 60-525.000.

Graven, Robert M.; Gorski, Anthony J.; Schertz, William W.; and Graae, Johan E. A., to United States of America, Energy. Modular assembly of a photovoltaic solar energy receiver. 4,118,249, Cl. 136-89.0PC.

Graveron, Bernard Jacques; and Essel, Alain Jacques, to Gole, Jean. Vibration damping through adherence to a layer comprising polyisoprene and the damped structure resulting. 4,118,258, Cl. 156-60.000.

Green, Sheryll C.; and Linse, Vonne D., to United States of America, Energy. Explosive welding of a tube into a tube sheet. 4,117,966, Cl. 228-2.500.

Gregorian, Razmic S.; and Namboodri, Chettoor G., to United Merchants and Manufacturers, Inc. Method for treating fabrics. 4,118,526, Cl. 427-350.000.

Greppmaier, Paul: *See—*
Meier, Heinz; Zurawski, Egon; and Greppmaier, Paul, 4,117,739, Cl. 74-404.000.

Griffin, Dan M.: *See—*
Allen, Royce H.; Sutton, Jerry L.; Griffin, Dan M.; Frye, Hal W.; and Colborn, Joseph G., 4,118,782, Cl. 364-565.000.

Griffith, Louis E.: *See—*
Ebner, Peter R.; and Griffith, Louis E., 4,118,711, Cl. 354-15.000.

Grimes, Dustin Marshall. Capsule dispenser having chambers rotatable relative to a dispensing outlet. 4,117,952, Cl. 221-5.000.

Groeneweg, Jan Willem: *See—*
Visser, Johannes; Oosthoek, Raoul Henricus Josephus; Groeneweg, Jan Willem; and Dijkstra, Hendrik, 4,118,520, Cl. 426-574.000.

Groff, Jerome J.: *See—*
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Gronen, Willy: *See—*
Feess, Erich; Springer, Hartmut; and Gronen, Willy, 4,118,186, Cl. 8-49.000.

Gross, Benjamin; and Schatz, Klaus Wilhelm, to Mobil Oil Corporation. Method for regenerating fluidizable solid particles employed in hydrocarbon conversion. 4,118,337, Cl. 252-417.000.

Gross, Benjamin; and Schatz, Klaus Wilhelm, to Mobil Oil Corporation. Method for regenerating a fluid cracking catalyst. 4,118,338, Cl. 252-417.000.

Gross, Daniel; and Genequand, Pierre, to Battelle Development Corporation. Fur-like photothermal converter surface. 4,117,829, Cl. 126-270.000.

Growney, Lawrence J., to Federal Paper Board Co., Inc. Display carton. 4,117,924, Cl. 206-45.140.

Gruber, Hermann: *See—*
Pedain, Josef; Wellner, Wolfgang; Gruber, Hermann; and Dietrich, Manfred, 4,118,376, Cl. 528-59.000.

Grumman Aerospace Corporation: *See—*
Witzke, Horst; Chen, Schoen-nan; Deb, Satyendra K.; and Russak, Michael A., 4,118,546, Cl. 429-111.000.
Witzke, Horst; Chen, Schoen-nan; Deb, Satyendra K.; Jost, Steven Robert; Reichman, Joseph; and Russak, Michael A., 4,118,547, Cl. 429-111.000.

Grundherr, Willy J., to Qume Corporation. Rotary wheel printing system. 4,118,129, Cl. 400-144.200.

Gruner, Hans; Terjung, Klaus; Sachse, Wolfgang; and Romerswinkel, Heinrich-Wilhelm, to Mannesmann Aktiengesellschaft. Cover device for casting vessels, ladles or other metallurgical treatment containers. 4,118,018, Cl. 266-275.000.

Gruner, Heinz Walter: *See—*
Simonsen, John; Gibson, Bruce Douglas; and Gruner, Heinz Walter, 4,117,720, Cl. 73-194.0EM.

GTE Automatic Electric Laboratories, Incorporated: *See—*
Ball, Edward R., 4,118,674, Cl. 331-17.000.
Lender, Adam, 4,118,686, Cl. 340-146.1AB.

GTE Laboratories Incorporated: *See—*
Goebel, Franz, 4,118,334, Cl. 252-182.100.

Guffin, Robert E.: *See—*
Trist, Nicolas P.; Guffin, Robert E.; Franklin, Walter M.; Crosby, James B., Jr.; Hallaway, Glen N.; and Tellier, James G., 4,117,397, Cl. 32-27.000.

Gugel, Georg, to Kraftwerk Union Aktiengesellschaft. Test system carrier for ultrasonic testing of nozzle seams, pipe connection seams and nozzle corners in pressure vessels, particularly reactor pressure vessels of nuclear power plants. 4,117,733, Cl. 73-634.000.

Guignard, Jean; and Lorre, Jean-Marie, to Schlumberger Technology Corporation. Method and apparatus for providing repeatable wireline depth measurements. 4,117,600, Cl. 33-133.000.

Guilleman, Lionel; and Thillays, Jacques Claude, to U.S. Philips Corporation. Opto-electronic device having coupled emitter and receiver. 4,118,633, Cl. 250-551.000.

Gulf Oil Corporation: *See—*
Allen, Loy F., 4,118,148, Cl. 417-12.000.

Gulf Research & Development Company: *See—*
Frayer, James Albert; Lese, Henri K.; McKinney, Joel Drexler; Metzer, Kirk J.; and Paraskos, John Angelo, 4,118,310, Cl. 208-210.000.
Innes, Robert A., 4,118,433, Cl. 260-683.510.
Selwitz, Charles M.; and Thayer, Helen I., 4,118,244, Cl. 106-270.000.

Guliana, Ronald T.: *See—*
Talley, Charles P.; Bradley, Guy M.; and Guliana, Ronald T., 4,118,316, Cl. 210-31.00C.

Gullfiber AB: *See—*
Johansson, Jan-Olof; Korpela, Heikki; and Spacek, Karel, 4,117,754, Cl. 83-307.200.

Gundermann, Rolf Karl, to Optical Activity Ltd. Polarimeters. 4,118,125, Cl. 356-116.000.

Gunn, Damon M. Mail preparation, sorting apparatus and method. 4,117,975, Cl. 235-494.000.

Gunther, Ronald G.: *See—*
Chireau, Roland F.; and Gunther, Ronald G., 4,118,551, Cl. 429-207.000.

Gutmann, Ingeborg, deceased: *See—*
Determann, Helmut; Bernt, Erich; Dollacker, Werner; Gutmann, Ingeborg, deceased; and Engelhardt, Gudrun, administrator, 4,118,279, Cl. 195-63.000.

Gutmann, Siegfried, administrator: *See—*
Determann, Helmut; Bernt, Erich; Dollacker, Werner; Gutmann, Ingeborg, deceased; and Engelhardt, Gudrun, administrator, 4,118,279, Cl. 195-63.000.

Gyi, Ko Ko; and Ragle, Herbert Underwood, to Burroughs Corporation. High performance floppy pack and associated system. 4,118,746, Cl. 360-99.000.

Gyrac Engineering Products Limited: *See—*
Lindsay, William Roy Mackintosh, 4,118,059, Cl. 294-74.000.

Haberlein, Harald; Nies, Herbert; and Scheidl, Franz, to Hoechst Aktiengesellschaft. Organic phosphites, process for their manufacture and their use as stabilizers. 4,118,352, Cl. 260-23.0XA.

Hadamovsky, Eugen; Hoppe, Wolfgang; Overhausen, Hans-Walter; Piotrowski, Bernhard; Schmid, Wehrhart; Schreiber, Georg; and Schroeder, Heinz, to Dynamit Nobel Aktiengesellschaft. Process and

apparatus for mass transfer between heterogeneous systems. 4,118,313, Cl. 560-78.000.

Haddock, Elvin D., to Yuma Desert Manufacturing, Inc. Moveable building board hoist. 4,117,939, Cl. 214-1.0SW.

Haferkamp, Dirk: *See—*
Hodzic, Alija; Haferkamp, Dirk; Stach, Heinrich; and Paetz, Eike, 4,118,276, Cl. 176-60.000.

Hafner, Erich, to United States of America, Army. Phase lock loop controlled offset local oscillator system. 4,118,673, Cl. 331-2.000.

Hagan, Joseph R.: *See—*
Hipchen, Donald E.; Skowronski, Michael J.; and Hagan, Joseph R., 4,118,533, Cl. 428-297.000.

Hagberg, Lars, to Hytec AB. Output regulation in hydraulic and hydropneumatic systems. 4,118,149, Cl. 417-26.000.

Hagemann, Ruth: *See—*
Rommele, Gunter; and Hagemann, Ruth, 4,118,515, Cl. 426-63.000.

Hagendoorn, Willem Jacob, to Fisher-Klosterman, Inc. Oil mist filtering apparatus and method. 4,118,206, Cl. 55-74.000.

Hager, Nathaniel E., Jr., to Armstrong Cork Company. Emissimeter and method of measuring emissivity. 4,117,712, Cl. 73-15.00A.

Hahn, Werner; and Schulze, Heinz, to VEB Pentacon Dresden Kamera-und Kinowerke. Measuring and control system for single lens reflex. 4,118,718, Cl. 354-55.000.

Hahs, William A. Dual-pump coupling. 4,118,142, Cl. 415-69.000.

Haines, Paul Gordon: *See—*
Popoff, Ivan Christoff; Mailey, Everett A.; and Haines, Paul Gordon, 4,118,378, Cl. 526-36.000.

Hall, Joseph H.: *See—*
Elsaesser, Fred L.; and Hall, Joseph H., 4,117,668, Cl. 60-39.030.

Hallaway, Glen N.: *See—*
Trist, Nicolas P.; Guffin, Robert E.; Franklin, Walter M.; Crosby, James B., Jr.; Hallaway, Glen N.; and Tellier, James G., 4,117,597, Cl. 32-27.000.

Halle, Edward: *See—*
Snyder, John M., 4,117,914, Cl. 190-58.00R.

Halm Instrument Co., Inc.: *See—*
Konars, Clement R.; Schlipf, Frank J.; and Quinci, Emanuel, 4,118,025, Cl. 271-273.000.

Halsall, Vincent M.: *See—*
Buckethal, Paul J.; Groff, Jerome J.; Halsall, Vincent M.; and Hennen, Roy E., 4,118,553, Cl. 429-234.000.

Haluska, Jerald R. Molding apparatus. 4,118,169, Cl. 425-583.000.

Hamade, Adib R.: *See—*
Ochi, Sam S.; Hamade, Adib R.; and Culmer, Daniel D., 4,118,640, Cl. 307-237.000.

Hamill, Herbert R.; and Potts, David E., to Engelhard Minerals & Chemicals Corporation. Method for producing clay slurries. 4,118,245, Cl. 106-288.00B.

Hamilton, C. Howard; and Ascani, Leonard A., Jr., to Rockwell International Corporation. Method for fabrication of honeycomb structures. 4,117,970, Cl. 228-173.00A.

Hamilton, Eddie J. Combination die head and chamfering tool. 4,118,140, Cl. 408-59.000.

Hammann, Ingeborg: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,118,486, Cl. 424-212.000.

Hanaoka, Naohiro; and Shimoda, Misao, to Olympus Optical Co., Ltd. Composite magnetic head. 4,118,747, Cl. 360-121.000.

Hanley, Michael A.; Miller, Lawrence A.; and Kinsey, Irvin H., to Polymer Corporation, The. Recovery of polyacetal resins. 4,118,345, Cl. 260-2.300.

Hanscom, Russell C. Multi-purpose lifting and mounting assembly. 4,118,010, Cl. 254-124.000.

Hansen Manufacturing Company, The: *See—*
Norton, James F.; and Silagy, Richard J., 4,118,006, Cl. 251-149.600.

Harada, Hideo; and Matsushita, Nobuaki, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Polyurethane hydrogel and method for the production of the same. 4,118,354, Cl. 260-29.2TN.

Harder, Arthur J., Jr.; and Kehl, Norman J., to Coach and Car Equipment Corporation. Cantilevered seat-supporting shell with built-in blower. 4,118,062, Cl. 296-63.000.

Hardigg, James S. Method of making a battery jar. 4,118,265, Cl. 156-242.000.

Hardin, David P.: *See—*
Oestreicher, Stephen L.; and Hardin, David P., 4,118,217, Cl. 71-92.000.

Hardy, Herbert L.: *See—*
Chambers, Melvin T.; and Hardy, Herbert L., 4,118,737, Cl. 352-130.000.

Hargreaves, Clifford McDonald, to U.S. Philips Corporation. Thermodynamic method and device for carrying out the method. 4,117,695, Cl. 62-86.000.

Harris Corporation: *See—*
Pan, Jing Jong; Arnold, Milton Phillip; and Barton, James Castle, 4,118,270, Cl. 156-659.000.
Varley, Robert Fred, 4,118,705, Cl. 343-100.0AD.

Harris, Fred A.: *See—*
Waxelbaum, Paul M.; Harris, Fred A.; and Brown, William J., 4,117,984, Cl. 241-73.000.

Harris, Gerald R. Vertical band saw and feed table. 4,117,756, Cl. 83-801.000.

Harris, Howard A., to Shell Oil Company. Disazo compounds. 4,118,385, Cl. 260-175.000.

Harris, Richard Hunter, to International Business Machines Corporation. Buckling spring torsional snap actuator. 4,118,611, Cl. 200-67.00A.

Harrison, Ronald A.: *See—*
Westeren, Herbert W.; and Harrison, Ronald A., 4,118,016, Cl. 266-130.000.

Hartmann, Horst, to Zyliss Zysett AG. Implement, in particular a household implement, for chopping cuttable material, in particular meat, onions or the like. 4,117,980, Cl. 241-37.500.

Hase, Marie: *See—*
Corluy, Hans Josephus; Moll, Franz; Muller, Herbert; and Hase, Marie, 4,118,228, Cl. 96-17.000.

Hasegawa, Taiji: *See—*
Kashiwazaki, Seiichi; and Hasegawa, Taiji, 4,117,820, Cl. 123-148.00E.

Hasegawa, Yoshio; Hiroyama, Koji; Shimada, Minoru; and Kawasaki, Haruhiko, to Kayaba Industry Co., Ltd. Automatic sewing machine. 4,117,790, Cl. 112-205.000.

Hasenwinkle, Earl Dean; and Wislocker, Frank, to Weyerhaeuser Company. Log transport and sawing system. 4,117,755, Cl. 83-435.100.

Hashimoto, Akihiko, to Olympus Optical Co., Ltd. X-contact device for bladed shutter. 4,118,721, Cl. 354-147.000.

Hashimoto, Kenji: *See—*
Koizumi, Yutaka; and Hashimoto, Kenji, 4,118,117, Cl. 355-8.000.

Hashimoto, Noboru: *See—*
Ohtsuki, Nobuo; Hayashi, Toshio; Imai, Akio; Takahashi, Yoshio; and Hashimoto, Noboru, 4,118,660, Cl. 318-571.000.

Hashimoto, Yasuo: *See—*
Ishino, Ken; Yamashita, Hiroshi; Ono, Nobuyuki; and Hashimoto, Yasuo, 4,118,704, Cl. 343-18.00A.

Hasson, Harrith M. Intrauterine contraceptive device. 4,117,838, Cl. 128-130.000.

Hattori, Kinya: *See—*
Watanabe, Akinori; Tanoshima, Katsuhide; Noguchi, Matsusaburo; and Hattori, Kinya, 4,117,778, Cl. 101-1.000.

Hauck, Bobbie W.: *See—*
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Hauser, Edward R., to Minnesota Mining and Manufacturing Company. Web of blended microfibers and crimped bulking fibers. 4,118,531, Cl. 428-224.000.

Hauser, Martin: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,118,442, Cl. 260-885.000.

Hauser, Raimund: *See—*
Muszumanski, Trude, 4,118,108, Cl. 350-184.000.

Hauville, Jean. Book support. 4,118,759, Cl. 362-98.000.

Haviv, Fortuna; and Patchornik, Abraham, to Yeda Research and Development Co. Ltd. Azidomethylaryl-substituted cephalosporin derivatives. 4,118,562, Cl. 544-26.000.

Hawley, E. Dale: *See—*
Fuller, Lawrence W.; and Hawley, E. Dale, 4,117,888, Cl. 172-1.000.

Hayashi, Hiromichi: *See—*
Niki, Hiroshi; Deya, Eiki; Doi, Toru; Igarashi, Seiichiro; and Hayashi, Hiromichi, 4,118,517, Cl. 426-271.000.

Hayashi, Toshio: *See—*
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Haybuster Manufacturing, Inc.: *See—*
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Hayssen Manufacturing Company: *See—*
James, Robert C.; Wilson, David A.; and Horsman, Dennis P., 4,117,646, Cl. 53-488.000.

Hayward, Gary G., to Benthos Incorporated. Internal pressure and vacuum monitoring apparatus. 4,117,718, Cl. 73-52.000.

Hecht, David L.: *See—*
Chang, I-Cheng; and Hecht, David L., 4,118,113, Cl. 350-358.000.

Heck, Friedrich. Manufacture of bearings. 4,117,580, Cl. 29-149.500.

Heck, Ronald M.: *See—*
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Heilig, George Charles: *See—*
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Heimberger, Helmut, to Optilon W. Erich Heilmann GmbH. Fastener. 4,117,575, Cl. 24-205.13D.

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Heller, Adam: *See—*
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Heller, Jack A., to United States of America, National Aeronautics and Space Administration. Apparatus and method for reducing thermal stress in a turbine rotor. 4,117,669, Cl. 60-39.140.

Helmstetter, Paul M., to Honeywell Inc. Measuring apparatus providing separate analog and digital outputs. 4,117,722, Cl. 73-362.0AR.

Helt, Raymond E., to Rass, Inc. Rip cord safety device for waders. 4,117,609, Cl. 36-4.000.

Hemphill, Charles Wayne. Digging teeth for an excavating bucket. 4,117,611, Cl. 37-142.00R.

Henaut, Eugene: *See—*
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Hendrickson, Luther G., to United States Steel Corporation. Shaft furnace design. 4,118,017, Cl. 266-187.000.
Hendrix, Hurshel V., to Phillips Petroleum Company. Underground storage. 4,117,684, Cl. 405-54.000.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Reese, Gunter; Kroke, Hermann; and Scheuermann, Fanny, 4,117,853, Cl. 132-7.000.
Reinwald, Elmar; and Schwuger, Milan Johann, 4,118,189, Cl. 8-137.000.
Henline, John W.; Bauer, James J.; and Morehouse, James O., to Clark Equipment Company. Engine cooling system for a skid-steer loader. 4,117,902, Cl. 180-54.00R.
Hennen, Roy E.: *See—*
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Herbstman, Sheldon, to Texaco Inc. Method for preparation of ethers. 4,118,425, Cl. 260-614.00A.
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Heritage Silversmiths Limited: *See—*
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Hewes, Charles Robert: *See—*
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Hewitt, Robert E., to Xerox Corporation. Developer roll drive. 4,118,115, Cl. 355-3.0DD.
Hex Fastener Corporation: *See—*
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Heyman, Joseph S., to United States of America, National Aeronautics and Space Administration. Pseudo continuous wave instrument. 4,117,731, Cl. 73-579.000.
Hickam, William M.: *See—*
Phillips, David C.; Hickam, William M.; and Carlson, Gerald L., 4,117,713, Cl. 73-17.00R.
Hickey, Christopher Daniel Dowling. Containers or carriers for goods. 4,117,875, Cl. 150-52.00R.
Hiday, David R.; and Larsen, Charles G., to General Instrument Corporation. VHF, UHF and superband tuner with automatic switching. 4,118,679, Cl. 334-1.000.
Higashi, Fukuji: *See—*
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Higuchi, Isao: *See—*
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Hilfiker, William K., to Hilfiker Pipe Co. Fabric structures for earth retaining walls. 4,117,686, Cl. 405-284.000.
Hillmann, Reinhard: *See—*
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Hinn, Werner, to RCA Corporation. Video amplifier with suppressed radio frequency radiation. 4,118,731, Cl. 358-65.000.
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Hipchen, Donald E.; Skowronski, Michael J.; and Hagan, Joseph R., to Celotex. Structural laminate and method for making same. 4,118,533, Cl. 428-297.000.
Hipoint Research, Inc.: *See—*
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Hirai, Toshio; and Niihara, Koichi, to Research Institute for Iron, Steel and Other Metals of the Tohoku University, The. Super hard-highly pure silicon nitrides having a preferred crystal face orientation. 4,118,539, Cl. 428-446.000.
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Hirano, Toru, to Hokushin Electric Works, Ltd. Technique for monitoring flow rate differences in water cooling conduit. 4,118,780, Cl. 364-510.000.
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Hirt Combustion Engineers: *See—*
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Hirt, John H., to Hirt Combustion Engineers. Apparatus and method of controlling gasoline vapor emissions. 4,118,170, Cl. 431-5.000.
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Hoechst Aktiengesellschaft: *See—*
Bestmann, Hans Jurgen; Stransky, Werner Theo; and Vostrowsky, Otto, 4,118,406, Cl. 260-410.90R.
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Steckelberg, Willi; Panke, Hans Ludwig; May, Adolf; and Bucking, Hans-Walter, 4,118,324, Cl. 252-8.900.
Strecker, Helmut; Kasmarker, Reinhard; and Kloss, Gerhard, 4,118,468, Cl. 424-1.000.

Vollmer, Hartfrid; and Hestermann, Klaus, 4,118,590, Cl. 560-190.000.

Hoenig, Stuart A., to Ransburg Corporation. Apparatus for measuring charge on, and density of, airborne particulates. 4,117,715, Cl. 73-28.000.

Hoffmann-La Roche Inc.: *See—*
Coffen, David Llewellyn, 4,118,587, Cl. 560-251.000.
Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,118,572, Cl. 544-369.000.
Walser, Armin, 4,118,386, Cl. 260-239.30T.

Hohmann, Kurt: *See—*
Mohr, Reinhard; and Hohmann, Kurt, 4,118,185, Cl. 8-42.00D.

Hohne, Gerd: *See—*
Bodig, Bernd; Schmied, Helmut; and Hohne, Gerd, 4,117,818, Cl. 123-148.00E.

Hokuetsu Paper Mills Ltd.: *See—*
Mayama, Masayoshi; Terada, Sadatugu; Muramatsu, Toshio; Kimura, Masayuki; Ishibara, Masao; and Kobayashi, Tohru, 4,118,231, Cl. 96-87.00A.

Hokushin Electric Works, Ltd.: *See—*
Hirano, Toru, 4,118,780, Cl. 364-510.000.
Suzuki, Kazuie; Torimaru, Takashi; and Akiyama, Chuji, 4,117,721, Cl. 73-194.0EM.

Holland, Charles L.; and Coulson, John N., Jr., to General Dynamics Corporation. Device for pre-setting tools for numerical controlled machine. 4,117,943, Cl. 214-6.00D.

Holy, Norman L.; and Nalesnik, Theodore E., to Western Kentucky University. Production of hydroxy ethers. 4,118,426, Cl. 260-615.00B.

Homsy, Charles A. Implantable material and method of preparing same. 4,118,532, Cl. 428-294.000.

Honaker, Donald E., to Standard Oil Company (Indiana). Oil shale retorting and off-gas purification. 4,117,886, Cl. 166-259.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Funabashi, Katsunori; and Kohyama, Mikihiro, 4,117,823, Cl. 123-198.00E.
Sato, Naohiko; and Osawa, Keiichi, 4,117,812, Cl. 123-117.00A.
Shishido, Toshimasa; and Ninomiya, Mitsuaki, 4,118,445, Cl. 261-44.00B.
Tanaka, Minoru; Kajitani, Ikuo; and Nagase, Hidenobu, 4,117,675, Cl. 60-302.000.
Yamazaki, Shuichi; Kajitani, Ikuo; and Kosato, Yasuo, 4,117,672, Cl. 60-282.000.
Yamazaki, Shuichi; and Kajitani, Ikuo, 4,117,673, Cl. 60-282.000.
Yazane, Shigeru; and Mogami, Youetsu, 4,117,741, Cl. 74-492.000.

Honeywell Inc.: *See—*
Anderson, Rogers H., 4,118,448, Cl. 264-1.000.
Ballinger, Dale O., 4,118,179, Cl. 432-59.000.
Helmstetter, Paul M., 4,117,722, Cl. 73-362.0AR.
Myers, Edward B., 4,118,008, Cl. 251-298.000.
Simon, Frank N., 4,117,716, Cl. 73-32.00A.

Honeywell Information Systems Inc.: *See—*
Gitzendanner, Louis G., 4,117,997, Cl. 248-20.000.
Raguin, Michel M.; and Joyce, Thomas F., 4,118,773, Cl. 364-200.000.

Hoop, William J., to Gamperdona Handels- und Finanz Aktiengesellschaft. Advertisement pillar. 4,118,082, Cl. 312-59.000.

Hoornstra, Clayton W.: *See—*
Broxterman, William E.; Urchick, Demetrius; Schmidt, Donald L.; and Hoornstra, Clayton W., 4,118,297, Cl. 204-159.110.

Hope, Henry F.; and Hope, Stephen F. Control apparatus responsive to liquid flow. 4,118,150, Cl. 417-40.000.

Hope, Stephen F.: *See—*
Hope, Henry F.; and Hope, Stephen F., 4,118,150, Cl. 417-40.000.

Hoppe, Wolfgang: *See—*
Hadamovsky, Eugen; Hoppe, Wolfgang; Overhausen, Hans-Walter; Piotrowski, Bernhard; Schmid, Wehrhart; Schreiber, Georg; and Schroeder, Heinz, 4,118,313, Cl. 560-78.000.

Horiba, Ltd.: *See—*
Tanei, Fumio; and Ikeda, Toshiaki, 4,118,779, Cl. 364-509.000.

Horiuchi, Norio; Kai, Shin-ichi-ro; and Shinjo, Masayoshi, to Daikin Kogyo Co., Ltd. Mold release agent. 4,118,235, Cl. 106-38.220.

Horng, Cheng Tzong; Michel, Alwin Earl; Rupprecht, Hans Stephan; and Schwenker, Robert Otto, to International Business Machines Corporation. Process for producing integrated circuit devices by ion implantation. 4,118,250, Cl. 148-1.500.

Horning, Donald E.; Morris, Leeson R.; and Douglas, James L., to Bristol-Myers Company. $\Delta^{2,3}$-1,4-Morpholine-2-carboxylic acid derivatives as antibacterial agents. 4,118,566, Cl. 544-105.000.

Hornle, Reinhold: *See—*
Baurecht, Heinz-Ewald; Hornle, Reinhold; and Muller, Gerd, 4,118,391, Cl. 260-314.500.
Molls, Hans-Heinz; Schiwy, Willy; Hornle, Reinhold; and Nebeling, Reinhard, 4,118,384, Cl. 260-163.000.

Horsman, Dennis P.: *See—*
James, Robert C.; Wilson, David A.; and Horsman, Dennis P., 4,117,646, Cl. 53-488.000.

Horzepa, John P.; and Potts, David E., to Engelhard Minerals & Chemicals Corporation. Process for producing clay slurries. 4,118,246, Cl. 106-288.00B.

Hoseney, Russell C.; and Ling, Rujira Srisuthep, to Kansas State University Research Foundation. Nonfat dry milk substitute for yeast-leavened baked products. 4,118,514, Cl. 426-62.000.

Hosker, Thomas M. Picture display assembly. 4,117,613, Cl. 40-152.100.

Hotten, Bruce W., to Chevron Research Company. Amine phosphate salts. 4,118,328, Cl. 252-32.500.

Hotten, Bruce W., to Chevron Research Company. Amine phosphate salts and phosphoramides. 4,118,329, Cl. 252-32.500.

Hotten, Bruce W., to Chevron Research Company. Amine phosphate salts and phosphoramides. 4,118,330, Cl. 252-32.500.

Hotz, Roger D.; Stach, Leonard J.; and Richter, Sidney B., to Velsicol Chemical Company. N-dialkoxyalkyl-N-dioxolanalkylene-α-haloalkanamides. 4,118,216, Cl. 71-88.000.

Hounsfield, Godfrey Newbold, to EMI Limited. Radiographic apparatus with correction for radiation hardness variations. 4,118,628, Cl. 250-445.00T.

Hounsfield, Godfrey Newbold, to EMI Limited. Radiology. 4,118,629, Cl. 250-445.00T.

Hoveler, Egon: *See—*
Zodrow, Rudolf; and Hoveler, Egon, 4,118,269, Cl. 156-560.000.

Howland, Leland L., to Thermo King Corporation. Multi-stroke throttle linkage mechanism. 4,117,740, Cl. 74-469.000.

Hsu, Grace F., to Minnesota Mining and Manufacturing Company. Tin/lead plating bath and method. 4,118,289, Cl. 204-43.00S.

Hubble, Fred F., III; and Tasseff, John B., II, to Xerox Corporation. Coronode connection arrangement. 4,118,751, Cl. 361-220.000.

Huff, Bobby J.: *See—*
LaGrone, Bobby D.; and Huff, Bobby J., 4,118,137, Cl. 404-76.000.

Hughes Aircraft Company: *See—*
Nelson, Lloyd A.; and Sekhon, Kalwant S., 4,118,756, Cl. 361-385.000.
Warther, Donald Paul, 4,118,696, Cl. 340-347.0NT.

Humber, Leslie G.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,118,394, Cl. 260-326.280.

Hunt, Arthur J., to French Oil Mill Machinery Company, The. Screw press apparatus. 4,117,776, Cl. 100-117.000.

Hunter, George Taylor. Frame arm joint structure for seat or chair structure. 4,118,069, Cl. 297-416.000.

Hurme, Herbert J.: *See—*
Current, Wayne A.; Genge, Bruce I.; Hurme, Herbert J.; and Zocher, Josef, 4,117,791, Cl. 112-222.000.

Husky Injection Molding Systems Limited: *See—*
Rees, Herbert; and Schad, Robert Dietrich, 4,118,168, Cl. 425-556.000.

Hutchins, Burleigh M.: *See—*
Friswell, David R.; and Hutchins, Burleigh M., 4,117,727, Cl. 73-422.0GC.

Hutchins, Frank. Treatment of conjunctivitis with powdered aluminum and eye protector/applicator. 4,117,842, Cl. 128-163.000.

Hutchins, Ned M., to Occidental Oil Shale, Inc. In situ oil shale retort with a horizontal sill pillar. 4,118,071, Cl. 299-2.000.

Hutzenlaub, Armin, to Erwin Kampf Maschinenfabrik, Firma. Roller cutting and winding machine. 4,117,986, Cl. 242-56.200.

Huwyler, Franco, to Fabbrica Italiana Magneti Marelli S.p.A. System of distributing pilot signals. 4,118,638, Cl. 307-11.000.

Hydrotechnic Corporation: *See—*
San Roman, Guillermo A., 4,118,322, Cl. 210-136.000.

Hydrotile Canada Limited: *See—*
Christian, Alfred, 4,118,165, Cl. 425-262.000.

Hytec AB: *See—*
Hagberg, Lars, 4,118,149, Cl. 417-26.000.

I.S.F. S.p.A.: *See—*
Pifferi, Giorgio; and Pinza, Mario, 4,118,396, Cl. 260-326.430.

I-T-E Imperial Corporation: *See—*
Kussy, Frank W.; and Shaffer, Howard R., 4,118,608, Cl. 200-56.00R.
Shaffer, Howard R., 4,118,607, Cl. 200-50.00A.

Ibsen, Robert L.; and Glace, William Richard, to Den-Mat, Inc. Method for repair of porcelain dental prostheses. 4,117,595, Cl. 32-8.000.

Ichijima, Isamu; Watanabe, Seiichi; and Miyagawa, Kazuo, to Nippon Steel Corporation. Apparatus for detecting a surface flaw of a material at high temperature. 4,118,732, Cl. 358-101.000.

Ichimura, Takeo: *See—*
Ishibashi, Kazufumi; Matsumaru, Shizuo; and Ichimura, Takeo, 4,118,238, Cl. 106-47.00Q.

Idemitsu Lion Co., Ltd.: *See—*
Nakamura, Minoru, 4,117,573, Cl. 24-74.00A.

Idram Engineering Company Est.: *See—*
Baudin, Lucien, 4,118,160, Cl. 418-260.000.

Igarashi, Seiichiro: *See—*
Niki, Hiroshi; Deya, Eiki; Doi, Toru; Igarashi, Seiichiro; and Hayashi, Hiromichi, 4,118,517, Cl. 426-271.000.

Iguchi, Shozo. Apparatus for inflicting electric injury upon land shellfish such as snails and the like. 4,118,752, Cl. 361-232.000.

Iguchi, Shozo: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,117,703, Cl. 72-38.000.

Iizuka, Shohei: *See—*
Ban, Itsuki; Iizuka, Shohei; and Funakoshi, Hisashi, 4,118,743, Cl. 360-73.000.

Ikeda, Akihiko: *See—*
Seko, Maomi; Miyake, Tetsuya; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, 4,118,457, Cl. 423-7.000.

Ikeda, Toshiaki: *See—*
Tanei, Fumio; and Ikeda, Toshiaki, 4,118,779, Cl. 364-509.000.

Ikehata, Yukio: *See*—
Nakao, Hideyuki; Kasai, Yasuhiro; Ikehata, Yukio; Masuda, Shigeyuki; Obara, Nobuo; and Nishida, Isamu, 4,117,665, Cl. 58-106.500.
Ikeura, Kenji, to Nissan Motor Company, Limited. Closed-loop mixture control system for internal combustion engine using error-corrected exhaust composition sensors. 4,117,815, Cl. 123-119.0EC.
Ilagan, Juan B., Jr.: *See*—
Red, Jerry F. P.; and Ilagan, Juan B., Jr., 4,118,407, Cl. 260-412.500.
Illy, Alois, to Klein, Schanzlin & Becker Aktiengesellschaft. Valve. 4,117,859, Cl. 137-219.000.
Imai, Akio: *See*—
Ohtsuki, Nobuo; Hayashi, Toshio; Imai, Akio; Takahashi, Yoshio; and Hashimoto, Noboru, 4,118,660, Cl. 318-571.000.
Imai, Susumu: *See*—
Uchida, Yoshiro; Mizuno, Toshihiko; Higuchi, Isao; Imai, Susumu; and Usui, Shyoichiro, 4,117,586, Cl. 29-568.000.
Imam, Imdad: *See*—
Barkan, Philip; and Imam, Imdad, 4,118,613, Cl. 200-82.00B.
Imamura, Kazuo: *See*—
Seko, Maomi; Miyake, Tetsuya; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, 4,118,457, Cl. 423-7.000.
Immer, Hans U.; and Abraham, Nedumparambil A., to Ayerst, McKenna & Harrison Limited. Decapeptide analogs of somatostatin. 4,118,380, Cl. 260-112.50S.
Imperial Chemical Industries Limited: *See*—
Cleare, Peter John Vernon; Kaye, Albert Edward; and Milner, David John, 4,118,412, Cl. 260-464.000.
Drewe, Nigel Wyndham; Hodson, Peter Robin; and Robson, Clive Gilroy, 4,118,218, Cl. 71-92.000.
Wood, William Malcolm Logan, 4,117,850, Cl. 131-2.000.
Inaba, Yoshihito: *See*—
Morishita, Masataka; Yokokawa, Yasuo; Nishikawa, Tokio; Mishiro, Masahiro; Ohashi, Shigeyasu; Fukushima, Mitsuru; Inaba, Yoshihito; and Matsuda, Tetsuo, 4,118,336, Cl. 252-316.000.
Inamorato, Jack Thomas: *See*—
Apostolatos, George Nikolas; Bohrer, James Calvin; and Inamorato, Jack Thomas, 4,118,332, Cl. 252-107.000.
Indesit Industria Elettrodomestici Italiana S.p.A.: *See*—
Lozar, Giorgio; and Favale, Renato, 4,118,708, Cl. 343-901.000.
Industrie Pirelli Societa per Azioni: *See*—
Borroni, Andrea, 4,118,593, Cl. 174-26.00R.
Ing. C. Olivetti & C., S.p.A.: *See*—
Pomella, Piero; and Lauro, Luciano, 4,118,771, Cl. 364-101.000.
Ingham, John D.: *See*—
Rhein, Robert A.; and Ingham, John D., 4,118,427, Cl. 568-852.000.
Ingham, Robert M., Jr., to Milliken Research Corporation. Handling yarn in a combination false twist and co-mingling jet apparatus. 4,117,656, Cl. 57-157.0TS.
Innes, Robert A., to Gulf Research & Development Company. Isoparaffin-olefin HF alkylation promoted with trifluoromethanesulfonic acid. 4,118,433, Cl. 260-683.510.
Inoue, Yoshio. Apparatus for incising on a film the precise contour of a required image. 4,117,751, Cl. 83-868.000.
Institut Francais du Petrole: *See*—
Salle, Robert; and Sillion, Bernard, 4,118,392, Cl. 260-326.00N.
Institute Po Obleklo I Textil: *See*—
Petrov, Georgi Mitev; Andonov, Blagoy Alexandrov; Trayanov, Svetozar Paissiev; and Georgiev, Georgi Dimitrov, 4,117,654, Cl. 57-19.000.
International Business Machines Corporation: *See*—
Argyle, Bernell Edwin; Dekker, Pieter; and Slonczewski, John Casimir, 4,118,793, Cl. 365-30.000.
Harris, Richard Hunter, 4,118,611, Cl. 200-67.00A.
Horng, Cheng Tzong; Michel, Alwin Earl; Rupprecht, Hans Stephan; and Schwenker, Robert Otto, 4,118,250, Cl. 148-1.500.
Levine, Samuel R.; Singh, Shanker; and Weinberger, Arnold, 4,118,786, Cl. 364-783.000.
McKenna, Charles M.; and Mueller, Wolfgang F., 4,118,630, Cl. 250-492.00A.
Mulholland, Patrick John; and Thomas, Colin Arthur, 4,117,737, Cl. 74-242.000.
Nussbaumer, Henri J., 4,118,784, Cl. 364-724.000.
International Computers Limited: *See*—
Bingham, Kenneth Charles Arthur; Gillingham, Alan George Albert; and Baldwin, Colin, 4,118,523, Cl. 427-97.000.
International Flavors & Fragrances Inc.: *See*—
Van Praag, Michel; and Duijf, Gerrit, 4,118,516, Cl. 426-96.000.
International Harvester Company: *See*—
Vacval, Dusan M.; and Domes, E. A., 4,117,911, Cl. 188-73.300.
International Nickel Company, Inc., The: *See*—
Ettel, Victor Alexander; and Devuyst, Eric August Pierre, 4,118,221, Cl. 75-108.000.
International Telephone and Telegraph Corporation: *See*—
Austin, Robert R.; and Moen, A. M. D., 4,117,725, Cl. 73-421.50R.
Goell, James E.; and Brandt, H. David, 4,118,100, Cl. 350-96.200.
Specht, Paul B., 4,117,772, Cl. 98-2.000.
Turbak, Albin F.; Thelman, John P.; and Auerbach, Andrew B., 4,118,350, Cl. 260-15.000.
Wallace, Charles H., 4,118,777, Cl. 364-475.000.
Ionit Anstalt Bernhad Berghaus: *See*—
Luckan, Johannes; Elwart, Jan; and Herter, Martin, 4,118,624, Cl. 250-326.000.
Irvin Industries Canada Ltd.: *See*—
Palm, Lorenz A.; and Webb, David B., 4,117,993, Cl. 244-145.000.
Webb, David B., 4,117,994, Cl. 244-152.000.
Irving, Frank: *See*—
Ward, Nazareen, 4,117,805, Cl. 119-5.000.
Ishibara, Masao: *See*—
Mayama, Masayoshi; Terada, Sadatugu; Muramatsu, Toshio; Kimura, Masayuki; Ishibara, Masao; and Kobayashi, Tohru, 4,118,231, Cl. 96-87.00A.
Ishibashi, Katsuji; Mitsui, Shigeo; and Kobayashi, Rikio, to Agency of Industrial Science & Technology. Activated carbon. 4,118,341, Cl. 252-438.000.
Ishibashi, Kazufumi; Matsumaru, Shizuo; and Ichimura, Takeo, to Nippon Kogaku K.K. Optical glass. 4,118,238, Cl. 106-47.00Q.
Ishiguro, Susumu; Komuro, Masuhiro; and Nakamura, Shigeru, to Showa Denko K.K. Filler for liquid chromatography. 4,118,347, Cl. 521-53.000.
Ishihara, Masamichi: *See*—
Mizuno, Fumio; and Ishihara, Masamichi, 4,118,794, Cl. 365-149.000.
Ishii, Hiromichi: *See*—
Ishii, Kazuhiro; Matsuzawa, Hideo; Kobayashi, Masao; and Ishii, Hiromichi, 4,118,419, Cl. 562-534.000.
Ishii, Kazuhiro; Matsuzawa, Hideo; Kobayashi, Masao; and Ishii, Hiromichi, to Mitsubishi Rayon Company, Ltd. Catalytic process for the preparation of an unsaturated carboxylic acid. 4,118,419, Cl. 562-534.000.
Ishikawa, Kazushige: *See*—
Kurata, Junichi; Ishikawa, Kazushige; and Nagashima, Nozomu, 4,118,039, Cl. 274-9.0RA.
Ishikawa, Yasuo: *See*—
Murakami, Takao; Ishikawa, Yasuo; and Ito, Masahiro, 4,118,151, Cl. 417-223.000.
Ishino, Ken; Yamashita, Hiroshi; Ono, Nobuyuki; and Hashimoto, Yasuo, to TDK Electronics Co., Ltd. Electromagnetic wave-absorbing wall. 4,118,704, Cl. 343-18.00A.
Isley, Walter F., to Teledyne Industries, Inc. Solid impurity detector. 4,117,717, Cl. 73-38.000.
Isomura, Masayoshi, to Nippon Electric Company, Ltd. Numerically controlled machine comprising a microprogrammable computer operable with microprograms for macroinstructions and for inherent functions of the machine. 4,118,776, Cl. 364-474.000.
Itaya, Nobushige: *See*—
Kitamura, Shigeyoshi; Itaya, Nobushige; Okuno, Yoshitoshi; Ohno, Nobuo; Matsuo, Takashi; Hirano, Masachika; Mizutani, Toshio; and Takeda, Hisami, 4,118,505, Cl. 424-275.000.
Itek Corporation: *See*—
Chang, I-Cheng; and Hecht, David L., 4,118,113, Cl. 350-358.000.
Ebner, Peter R.; and Griffith, Louis E., 4,118,711, Cl. 354-15.000.
Ito, Fumio: *See*—
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Masaharu; and Shinoda, Nobuhiko, 4,118,713, Cl. 354-23.00D.
Ito, Masahiro: *See*—
Murakami, Takao; Ishikawa, Yasuo; and Ito, Masahiro, 4,118,151, Cl. 417-223.000.
Ito, Tadashi: *See*—
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Masaharu; and Shinoda, Nobuhiko, 4,118,713, Cl. 354-23.00D.
Suzuki, Masayuki; Sakurada, Nobuaki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyashu, 4,118,716, Cl. 354-38.000.
Ito, Yukio; and Morishima, Susumu, to Hitachi Denshi Engineering Kabushiki Kaisha; and Musashi Kabushiki Kaisha. Tape winding arrangement for paper bundle binding apparatus. 4,117,650, Cl. 53-587.000.
Itoh, Tsutomu, to Onoda Cement Company, Ltd. Paper cups. 4,117,971, Cl. 229-1.50B.
ITT Industries, Inc.: *See*—
Schadow, Rudolf; and Hinze, Klaus, 4,118,609, Cl. 200-67.0DA.
Ives, Robert E.: *See*—
United States of America, National Aeronautics and Space Administration; Wall, William A., Jr.; Ives, Robert E.; Bruce, Miles Melvin, Jr.; Pryor, Peter Paul, Jr.; and Gard, Leslie H., 4,118,620, Cl. 219-124.320.
Ivosevic, Strahinja, to Sulzer Brothers Limited. Fuel injection pump having choke means in overflow line. 4,118,156, Cl. 417-494.000.
Iwahara, Makoto; and Mori, Toshinori, to Victor Company of Japan, Limited. Stereophonic sound reproduction system. 4,118,599, Cl. 179-1.00G.
Iwama, Hideto: *See*—
Okajima, Hidekazu; and Iwama, Hideto, 4,118,714, Cl. 354-31.000.
Iwasa, Hitoo: *See*—
Kano, Gota; and Iwasa, Hitoo, 4,117,587, Cl. 29-571.000.
Izumi, Kazuo: *See*—
Izumi, Kazuto; and Izumi, Kazuo, 4,118,785, Cl. 364-754.000.
Izumi, Kazuto; and Izumi, Kazuo, to Nippon Telegraph and Telephone Public Corporation. Method and apparatus for digital attenuation by pattern shifting. 4,118,785, Cl. 364-754.000.
J. B. Foote Foundry Co., The: *See*—
Jones, Ronald N.; and Cline, Devin R., 4,117,652, Cl. 56-11.800.
J. I. Case Company: *See*—
Youngers, Stephen Anthony, 4,117,890, Cl. 172-40.000.
Jackson, Edwin C. Camber adjusting tool. 4,117,709, Cl. 72-386.000.
Jacobs, Bernardus Antonius Johannus: *See*—
Bouwhuis, Gijsbertus; Braat, Josephus Johannes Maria; and Jacobs, Bernardus Antonius Johannus, 4,118,734, Cl. 358-128.000.

Jacobs, William B.: *See*—
Goodson, Louis H.; and Jacobs, William B., 4,117,714, Cl. 73-23.000.
Jacobson, Sava. Telephone answering device having simplified mechanical controls. 4,118,602, Cl. 179-6.00R.
Jagenberg-Werke AG: *See*—
Zodrow, Rudolf; and Hoveler, Egon, 4,118,269, Cl. 156-560.000.
Jager, Horst; and Dehmel, Georg, to Bayer Aktiengesellschaft. Reactive mono-azo dyestuffs having a 4-amino-3,5(or-6)-disulfoacetic acid coupling component and a reactive group attached to the diazo component. 4,118,382, Cl. 260-154.000.
Jahnke, Richard William, to Lubrizol Corporation, The. Method for working metal and lubricants for use therein. 4,118,331, Cl. 252-32.70E.
James, Harold; and Buggy, Martin, to British Industrial Plastics Limited. Moulding thermosetting compositions. 4,118,365, Cl. 260-39.00R.
James, Michael, to Allen & Hanburys Limited. Device for dispensing medicaments. 4,117,844, Cl. 128-266.000.
James, Robert C.; Wilson, David A.; and Horsman, Dennis P., to Hayssen Manufacturing Company. Method of applying a lid to a case. 4,117,646, Cl. 53-488.000.
Jans, Johannes M., to U.S. Philips Corporation. Electroless copper plating bath. 4,118,234, Cl. 106-1.230.
Japan Storage Battery Company Limited: *See*—
Fukuba, Kiyohide, 4,117,969, Cl. 228-140.000.
Jardin, Hans: *See*—
Bienert, Horst; and Jardin, Hans, 4,118,063, Cl. 296-137.00B.
Jarrett, Robert B.; and Zobel, Don W., to Motorola, Inc. Threshold circuit suitable for use in electronic ignition systems. 4,117,819, Cl. 123-148.00E.
Jensen, Harald: *See*—
Mitzlaff, Michael; Warning, Klaus; and Jensen, Harald, 4,118,500, Cl. 424-267.000.
Jewett, David N.: *See*—
Mackintosh, Brian H.; and Jewett, David N., 4,118,197, Cl. 422-246.000.
Jin, Jung Il; and Kraft, Paul, to Stauffer Chemical Company. Cross-linked vinyl halide polymers as flame retardant additives for thermoplastic polyester. 4,118,440, Cl. 260-873.000.
Jirkovsky, Ivo: *See*—
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,118,394, Cl. 260-326.280.
Joh. Friedrich Behrens Aktiengesellschaft: *See*—
Elliesen, Wolfgang, 4,117,767, Cl. 91-461.000.
Johannesen, Donald D., to Bendix Corporation, The. Disc brake and mounting therefor. 4,117,910, Cl. 188-71.900.
Johansson, Jan-Olof; Korpela, Heikki; and Spacek, Karel, to Gullfiber AB. Transverse cutter. 4,117,754, Cl. 83-307.200.
John, Veit, to Hoechst Aktiengesellschaft. Process for device for preparing ignitable fuel mixtures. 4,117,810, Cl. 123-1.00R.
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Johns-Manville Corporation: *See*—
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Johnson, James H.; Fowler, Arnold L.; Brooks, Julius E.; and Friend, Harvey H., to Olin Corporation. Fire control mechanism. 4,117,761, Cl. 89-129.00B.
Johnson, Jerry Lynn; and Liebhold, Martin R., to Landes Manufacturing Co. Furniture drawer. 4,118,089, Cl. 312-351.000.
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Johnson, Leighton Clifford, to Miles Laboratories, Inc. Pipette. 4,117,728, Cl. 73-425.600.
Johnson, Leopold J., to United States of America, Navy. Method of manufacturing three dimensional integrated circuits. 4,117,588, Cl. 29-608.000.
Johnson, Michael Ross; and Melvin, Lawrence Sherman, Jr., to Pfizer Inc. 9-Hydroxyhexahydrodibenzo[O,d]pyrans, 1-substituted-9-hydroxyhexahydrodibenzo[b,d]pyrans and intermediates therefor. 4,118,559, Cl. 542-432.000.
Johnson, Roy E. Hose winding mechanism. 4,117,991, Cl. 242-86.000.
Johnson, William George, to Crane Air Trac Incorporated. Ventilation system for the supply of air or exhaustion of fumes. 4,117,773, Cl. 98-115.0VM.
Johnstons & Associates, Inc.: *See*—
Gomolak, Theodore M., 4,117,615, Cl. 40-363.000.
Jones, Ivor Wynn; and Robinson, Graham, to Chloride Silent Power Limited. Sodium sulphur cells. 4,118,545, Cl. 429-104.000.
Jones, Kenneth L., to Procter & Gamble Company, The. Article and method for fabric softening and static control. 4,118,525, Cl. 427-242.000.
Jones & Laughlin Steel Corporation: *See*—
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Jones, Paul W.: *See*—
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Jones, Ronald N.; and Cline, Devin R., to J. B. Foote Foundry Co., The. Transmission for self-propelled, walking lawn mowers. 4,117,652, Cl. 56-11.800.
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Joustra, Annie H.; La Haye, Teunis P.; and Kesselaar, Fernand H., to Shell Oil Company. Preparation of alkyl chlorides. 4,118,428, Cl. 260-663.000.
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Juckniess, Paul R.; and Johnson, David R., to Dow Chemical Company, The. Method of electrowinning titanium. 4,118,291, Cl. 204-64.00T.
Juhn, Hyunil; and Wistreich, Hugo E., to B. Heller & Company. Method of producing smoke flavoring for foods. 4,118,519, Cl. 426-533.000.
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Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich. Method for dimerization of olefins. 4,118,432, Cl. 260-683.15D.
Kabushiki Kaisha Daini Seikosha: *See*—
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Kabushiki Kaisha Komatsu Seisakusho: *See*—
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Yamazaki, Shuichi; and Kajitani, Ikuo, 4,117,673, Cl. 60-282.000.
Kalas, Barbara A. Revolving planter. 4,117,630, Cl. 47-67.000.
Kanazawa, Kuniyoshi. Bicycle. 4,118,045, Cl. 280-283.000.
Kano, Gota; and Iwasa, Hitoo, to Matsushita Electronics Corporation. Negative-resistance semiconductor device. 4,117,587, Cl. 29-571.000.
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Kawahara, Kiyoshi: *See*—
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Kelly, Hartleigh; Kelly, Bruce A.; and Kelly, Ross A. Mast and keel movement for sailing vessels. 4,117,797, Cl. 114-91.000.
Kelly, Ross A.: *See*—
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Kemper, Yves Jean; and Pouliot, Harvey N., to Vadetec Corporation. Variable stroke expansible energy conversion machine having static control means. 4,117,736, Cl. 74-60.000.
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Kennedy, George C., to Kennametal Inc. High temperature, high pressure apparatus having a ductile driver element. 4,118,161, Cl. 425-77.000.
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Kerr, Andrew Guy; and Morley, Robert Arthur, to Ferranti Limited. Load transfer. 4,118,012, Cl. 254-173.00R.
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Kerr, John L., to United States of America, Army. Microstrip-fed parasitic array. 4,118,706, Cl. 343-700.0MS.
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Klein, Fritz S.; and Ross, John, to Massachusetts Institute of Technology. Method for mass separation of a gaseous mixture. 4,118,296, Cl. 204-157.10R.
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Klein, Howard P., to Texaco Development Corp. Polyols from 2,3-morpholinediones. 4,118,422, Cl. 260-561.00A.
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Klemm, Reinhart, to Ernst Leitz Wetzlar GmbH. Electric motor for photographic cameras. 4,118,659, Cl. 318-560.000.
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Kopelev, Fridrikh Lvovich; Kossek, Valentin Vladimirovich; Dubinenko, Askold Fedorovich; and Sherstinsky, Semen Markovich. Spindle assembly for a precision machine tool. 4,117,750, Cl. 82-30.000.
Kopinski, Martin W.: *See*—
Linde, John P.; Kopinski, Martin W.; and Lewis, Donald R., 4,117,617, Cl. 42-1.00S.
Korenowski, Theodore Frank; and Lancy, Leslie Emery, to Dart Industries Inc. Regeneration of plastic etchants. 4,118,295, Cl. 204-151.000.
Korpela, Heikki: *See*—
Johansson, Jan-Olof; Korpela, Heikki; and Spacek, Karel, 4,117,754, Cl. 83-307.200.
Kosato, Yasuo: *See*—
Yamazaki, Shuichi; Kajitani, Ikuo; and Kosato, Yasuo, 4,117,672, Cl. 60-282.000.
Koshelenko, Gennady Petrovich; Pasynkov, Rafail Moiseevich; Sin, Mikhail Alexandrovich; and Shemper, Leonid Isaakovich. Axial-piston hydraulic machine. 4,117,770, Cl. 92-57.000.
Kossek, Valentin Vladimirovich: *See*—
Kopelev, Fridrikh Lvovich; Kossek, Valentin Vladimirovich; Dubinenko, Askold Fedorovich; and Sherstinsky, Semen Markovich, 4,117,750, Cl. 82-30.000.
Kostevc, Bernard: *See*—
Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, 4,118,366, Cl. 260-40.00R.
Kostjuk, Boris Dmitrievich: *See*—
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Zjukin, Nikolai Stepanovich; Kostjuk, Boris Dmitrievich; Shaikevich, Stanislava Stanislavovna; Motsak, Yaroslav Feodosievich; Fedulaev, Vitaly Pavlovich; Kolchemanov, Nikolai Alexandrovich; Ugarov, Valentin Mikhailovich; Losev, Viktor Vasilievich; Drui, Mark Simonovich; Lavrinovich, Alla Alexandrovna; Shpotakovsky, Dmitry Fedorovich; and Chizhov, Stanislav Viktorovich, 4,117,968, Cl. 228-124.000.
Koula, Zdenek; Nirk, Peter; and Wullschleger, Hans, to Stots & Co. AG. Apparatus for coating blanks or the like formed of textile material, especially clothing inserts. 4,117,799, Cl. 118-6.000.
Kovatch, George N.: *See*—
Rosey, Richard; Kovatch, George N.; and Simon, Ned H., 4,118,639, Cl. 307-147.000.
Kraft, Harold D.: *See*—
Kraft, Jack A.; and Kraft, Harold D., 4,118,801, Cl. 366-111.000.
Kraft, Jack A.; and Kraft, Harold D. Rack for vessels and means for agitating the vessels in the rack. 4,118,801, Cl. 366-111.000.
Kraft, Paul: *See*—
Jin, Jung Il; and Kraft, Paul, 4,118,440, Cl. 260-873.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Gugel, Georg, 4,117,733, Cl. 73-634.000.
Neeb, Karl-Heinz; and Richter, Heinrich, 4,118,317, Cl. 210-32.000.
Schabert, Hans-Peter; Bremer, Hans; and Strickroth, Erich, 4,118,277, Cl. 176-87.000.
Krapcho, John: *See*—
Turk, Chester F.; and Krapcho, John, 4,118,558, Cl. 542-429.000.
Krause, Hermann: *See*—
Rahn, Oskar; and Krause, Hermann, 4,118,058, Cl. 294-67.00B.
Krause, Joachim; Streinstrasser, Ralf; Pohl, Ludwig; Del Pino, Fernando; and Weber, Georg, to Merck Patent Gesellschaft mit beschrankter Haftung. Liquid crystalline materials of reduced viscosity. 4,118,335, Cl. 252-299.000.
Kredo, Theodore A., to California Precision. Fluorescent light fixture. 4,118,766, Cl. 362-427.000.
Kregler, Helmuth; and Hillmann, Reinhard, to SKF Industries, Inc. Sealed antifriction bearing with sealing element. 4,118,080, Cl. 308-187.100.
Krenzer, John: *See*—
Wu, Chin Ching; and Krenzer, John, 4,118,390, Cl. 260-306.80R.
Krieger, Bernhard: *See*—
Philippson, Rainer; Krieger, Bernhard; Casals-Stenzel, Jorge; Kerb, Ulrich; Losert, Wolfgang; Prezewowsky, Klaus; Wiechert, Rudolf; and Bittler, Dieter, 4,118,488, Cl. 424-238.000.
Kroh, Adolf: *See*—
Fuchs, Otto; and Kroh, Adolf, 4,118,387, Cl. 260-281.00A.
Kroke, Hermann: *See*—
Reese, Gunter; Kroke, Hermann; and Scheuermann, Fanny, 4,117,853, Cl. 132-7.000.
Krueger, Wallace F. Apparatus for transferring metered quantities of material from one location to another. 4,118,799, Cl. 366-161.000.
Kruesi, Paul R., to Cato Research Corporation. Process for desulfurizing coal. 4,118,200, Cl. 44-1.00R.

Krutzner, Karl, jun.: *See*—
Mollenkopf, Hans; Ritzmann, Horst; Wurr, Jurgen; Schmits, Heinz-Berbert; Heinemann, Otto; Krutzner, Karl, jun.; and Schossler, Werner, 4,118,176, Cl. 432-14.000.

Kubota, Ltd.: *See*—
Nishida, Tsuyeshi, 4,117,817, Cl. 123-136.000.

Kubota, Naohiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,118,369, Cl. 260-45.80N.

Kubota, Tatsuo: *See*—
Suzuki, Hideo; Sato, Takahisa; Kubota, Tatsuo; Osaka, Shigemi; and Komatsu, Shigeru, 4,118,402, Cl. 260-346.750.

Kugele, Thomas Gordon, to Cincinnati Milacron Chemicals Inc. Organotin mercaptoalkanol ester sulfide stabilizers for PVC resins. 4,118,371, Cl. 260-45.75S.

Kuist, Charles H.; Squitieri, Vincent; and Seeger, Richard E., to Chomerics, Inc. Isolated path coupling system. 4,118,102, Cl. 339-17.00F.

Kumar, Anil: *See*—
Bansal, Jag M.; and Kumar, Anil, 4,117,830, Cl. 126-271.000.
Bansal, Jag M.; and Kumar, Anil, 4,117,831, Cl. 126-271.000.

Kumhyr, Elmer B., to Noramco, Inc. DC signaling circuit for use in conjunction with isolation transformers. 4,118,603, Cl. 179-16.00E.

Kunstmann, Rudolf; and Kaiser, Joachim, to Hoechst Aktiengesellschaft. Substituted 3,4-dihydro-2H-isoquinolin-1-thiones. 4,118,494, Cl. 424-258.000.

Kunstmann, Rudolf; Lerch, Ulrich; and Gerhards, Hermann, to Hoechst Aktiengesellschaft. Antidepressantly active 5-(4-aminophenyl)-hexahydro-1H-indeno-(1,2-b)pyridine. 4,118,497, Cl. 424-267.000.

Kuo, Cho-Chou: *See*—
Caldwell, Harlan D.; Kuo, Cho-Chou; and Kenny, George E., 4,118,469, Cl. 424-1.000.

Kupfer, David J.: *See*—
Mc Partland, Richard J.; Foster, F. Gordon; and Kupfer, David J., 4,117,834, Cl. 128-2.00S.

Kupfer, Theo, to BBC Brown, Boveri & Company Limited. Device for locking electrical units. 4,118,133, Cl. 403-24.000.

Kuramoto, Yoshio; Ueda, Hiroshi; and Uesugi, Kyozo, to Minolta Camera Kabushiki Kaisha. Exchangeable lenses for use in internal light measuring type single lens reflex cameras. 4,118,726, Cl. 354-289.000.

Kuraray Company, Limited: *See*—
Nakagawa, Junyo; Akagi, Takao; and Hiramatsu, Koji, 4,118,529, Cl. 428-91.000.

Kurata, Junichi; Ishikawa, Kazushige; and Nagashima, Nozomu, to Pioneer Electronic Corporation. Tonearm position setting apparatus. 4,118,039, Cl. 274-9.0RA.

Kurei, Hiroshi; and Shono, Tetsuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Shutter speed display for viewfinder of fixed point exposure meter camera. 4,118,725, Cl. 354-289.000.

Kurland, Lawrence G.; and Freeman, Michael J., to Freeman, Michael J. Real time conversational toy having secure playback response. 4,117,605, Cl. 35-9.00A.

Kurono, Hitoshi: *See*—
Taninaka, Kuniaki; Kurono, Hitoshi; and Kasai, Tsutomu, 4,118,506, Cl. 424-277.000.

Kurumada, Tomoyuki: *See*—
Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,118,368, Cl. 260-45.80N.

Kusaka, Katsushi: *See*—
Asada, Chiaki; Kusaka, Katsushi; and Kajima, Hisashi, 4,117,565, Cl. 75-204.000.

Kussy, Frank W.; and Shaffer, Howard R., to I-T-E Imperial Corporation. Trip indicator. 4,118,608, Cl. 200-56.00R.

Kyburz, Emilio: *See*—
Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,118,572, Cl. 544-369.000.

Kysor Industrial Corporation: *See*—
Vogel, Robert E., 4,117,698, Cl. 62-256.000.

L.A. Dreyfus Company: *See*—
Phillips, Michael, 4,117,645, Cl. 53-431.000.

L.A. Gauge Co. Inc.: *See*—
Trist, Nicolas P.; Guffin, Robert E.; Franklin, Walter M.; Crosby, James B., Jr.; Hallaway, Glen N.; and Tellier, James G., 4,117,597, Cl. 32-27.000.

LaBarre, Ronald L., to Diamond Shamrock Corporation. Batch sodium hypochlorite generator. 4,118,307, Cl. 204-268.000.

Labofina S. A.: *See*—
Debus, Henri R.; and Cahen, Raymond M., 4,118,342, Cl. 252-439.000.

Laboratories om Societe Anonyme: *See*—
Baudet, Pierre; Ricard, Jean-Paul; and Schultheiss, Adrian, 4,118,583, Cl. 560-63.000.

Lachance, Gilles. Bottle carrier. 4,117,933, Cl. 206-583.000.

Lacher, Jorge Halder. Automatic discharge centrifuge and method. 4,118,248, Cl. 127-19.000.

Lackey, Robert S.; Young, Robert R.; and Kastovich, John C., to Westinghouse Electric Corp. Cabinet base construction for roof top air conditioner. 4,118,083, Cl. 312-100.000.

Ladin, Eli M.; and Reynolds, Mark P., to Federal-Mogul Corporation. Clutch throw-out bearing improvement. 4,117,917, Cl. 192-98.000.

Laesser, Claude, to Ebauches S.A. Electro-optic passive display device and method for its manufacture. 4,118,111, Cl. 350-334.000.

Laesser, Claude: *See*—
Saurer, Eric; and Laesser, Claude, 4,118,110, Cl. 350-334.000.

Lagarde, Pierre; and Denoor, Gaston, to Metalimphy & B.V.S. Method of manufacturing an improved conduit for conveyance of hot fluid. 4,117,584, Cl. 29-452.000.

Lagarelli, Carmen J.; and Rudewick, Charles J., to Speakman Company. Showerhead. 4,117,979, Cl. 239-381.000.

LaGrone, Bobby D.; and Huff, Bobby J., to U.S. Rubber Reclaiming Co., Inc. Pavement and process of providing the same. 4,118,137, Cl. 404-76.000.

La Haye, Teunis P.: *See*—
Joustra, Annie H.; La Haye, Teunis P.; and Kesselaar, Fernand H., 4,118,428, Cl. 260-663.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Malafosse, Jean, 4,118,465, Cl. 423-415.00P.

Laitram Corporation, The: *See*—
Lapeyre, James M., 4,117,602, Cl. 33-352.000.

Laliberte, Real: *See*—
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,118,511, Cl. 424-330.000.

Lami, Richard A., to Jones & Laughlin Steel Corporation. Remotely adjustable hydraulic pressure regulator. 4,117,706, Cl. 72-245.000.

Lamothe, Surguies M. Anchor bolt thread protector and sleeve system. 4,117,643, Cl. 52-699.000.

Lancy, Leslie Emery: *See*—
Korenowski, Theodore Frank; and Lancy, Leslie Emery, 4,118,295, Cl. 204-151.000.

Landes Manufacturing Co.: *See*—
Johnson, Jerry Lynn; and Liebhold, Martin R., 4,118,089, Cl. 312-351.000.

Landler, Josef: *See*—
Opitz, Konrad; Landler, Josef; and Worfel, Erhard, 4,118,184, Cl. 8-26.000.

Lang, Edward Russell: *See*—
Welder, Gerald Elvin; Lang, Edward Russell; and Slagle, Charles Wilmer, 4,118,318, Cl. 210-58.000.

Lang, Hans-Jochen; and Muschaweck, Roman, to Hoechst Aktiengesellschaft. Thiazolidine derivatives. 4,118,501, Cl. 424-270.000.

Lang, Stanley Albert, Jr.; Fabio, Paul Frank; Lin, Yang-I; Murdock, Keith Chadwick; and Fields, Thomas Lynn, to American Cyanamid Company. 2,6-Bis(1-piperidinoalkylideneamino)anthraquinones and method of treating cecal and hepatic amebic infections therewith. 4,118,498, Cl. 424-267.000.

Lange, Gerhard; and Schilling, Gunter, to Siemens Aktiengesellschaft. Device to house a surge diverter. 4,118,682, Cl. 337-34.000.

Langley, Morley P.: *See*—
Davies, Norman; Langley, Morley P.; and Peppel, Howard C., deceased, 4,118,755, Cl. 361-379.000.

Lankes, Erich: *See*—
Weber, Paul; Lankes, Erich; Butschko, Gerhard; Ritzmann, Horst; and Bohm, Peter Wolfgang, 4,118,177, Cl. 432-14.000.

Lannert, Kent P., to Monsanto Company. Chemical compounds. 4,118,420, Cl. 562-583.000.

Lannuzel, Roger, to Compagnie Industrielle des Telecommunications S.A. Chopper including transistor switches. 4,118,641, Cl. 307-240.000.

Lapeyre, James M., to Laitram Corporation, The. Electromagnetic compass. 4,117,602, Cl. 33-352.000.

Laplante, Paul R., to United States of America, Army. MOX multilayer switching device comprising niobium oxide. 4,118,727, Cl. 357-10.000.

Larkin, Edward P. Pitching target with ball collector. 4,118,028, Cl. 273-26.00A.

Larkin, Wallace Keith. Acoustical voice transmitting headset. 4,118,606, Cl. 179-156.00A.

Larsen, Charles G.: *See*—
Hiday, David R.; and Larsen, Charles G., 4,118,679, Cl. 334-1.000.

Larsen, Hans-Ole, to Ultrasona AG. Process for improving the bulkiness or texturation of synthetic multifilament textile materials. 4,118,188, Cl. 8-130.100.

Larsen, Ronald L.; and Berry, Clifford W., to Conwed Corporation. Plastic packaging product for separation of components. 4,117,932, Cl. 206-419.000.

Larson, John C. Apparatus for guiding row crop processing implements. 4,117,889, Cl. 172-26.000.

Larsson, Rolf: *See*—
Eriksson, Jan-Christer; Larsson, Rolf; Rosengren, Ake; and Hjelte, Maj-Britt, 4,118,485, Cl. 424-183.000.

Latos, Edwin J., to UOP Inc. Use of noble metal solutions in catalyst regeneration zones. 4,118,339, Cl. 252-417.000.

Lattrell, Rudolf; Kief, Heinrich; and Bahr, Hermann, to Hoechst Aktiengesellschaft. 3,5,5-Trimethylhexanoyl ferrocene. 4,118,509, Cl. 424-295.000.

Lauro, Luciano: *See*—
Pomella, Piero; and Lauro, Luciano, 4,118,771, Cl. 364-101.000.

Lautenschlager, Karl, Jr.; and Lautenschlager, Reinhard, to Karl Lautenschlager KG. Over-center knuckle-joint hinge. 4,117,569, Cl. 16-139.000.

Lautenschlager, Reinhard: *See*—
Lautenschlager, Karl, Jr.; and Lautenschlager, Reinhard, 4,117,569, Cl. 16-139.000.

LaVene, Leon F., to Schmelzer Corporation. Method of making housing cover and tube. 4,117,708, Cl. 72-324.000.

Lavrinovich, Alla Alexandrovna: *See*—
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Zjukin, Nikolai Stepanovich; Kostjuk, Boris Dmitrievich; Shaikevich, Stanislava Stanislavovna; Motsak, Yaroslav Feodosievich; Fedulaev, Vitaly Pavlovich; Kolchemanov, Niko-

lai Alexandrovich; Ugarov, Valentin Mikhailovich; Losev, Viktor Vasilievich; Drui, Mark Simonovich; Lavrinovich, Alla Alexandrovna; Shpotakovsky, Dmitry Fedorovich; and Chizhov, Stanislav Viktorovich, 4,117,968, Cl. 228-124.000.

Lawler, Matusky & Skelly Engineers: *See*—
McGroddy, Peter M., 4,117,726, Cl. 73-421.00R.

Lazareck, Jack A. Shredder hammer with replaceable tip. 4,117,985, Cl. 241-197.000.

Lazet, Frank J.; Meador, D. John; and Webster, Richard G., to PQ Corporation. Preparation of highly alkaline silicates. 4,118,463, Cl. 423-334.000.

Lebidine, Samuel: *See*—
Shakiba, Hosein M., 4,118,173, Cl. 431-202.000.

Le Blanc, John R., to Monsanto Company. Beneficiating agent composition. 4,118,441, Cl. 260-874.000.

Lechler, Rolf, to Audi Nsu Auto Union Aktiengesellschaft. Device for aspiration of lubricating oil from the supply of a combustion engine. 4,117,907, Cl. 184-6.200.

Ledig, Kurt W., to American Home Products Corporation. 7-(Substituted)-7H-pyrrolo[3,2-f]quinazoline-1,3-diamines. 4,118,561, Cl. 542-470.000.

Lee, Soo-Il, to Owens-Illinois, Inc. Plastic extrusion and apparatus. 4,118,163, Cl. 425-146.000.

Lee, Thomas B. K.: *See*—
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,118,401, Cl. 260-333.000.

Lefrancier, Pierre: *See*—
Rigbi, Meir; Klausner, Yakir; Lefrancier, Pierre; and Sache, Edgar, 4,118,575, Cl. 560-13.000.

Lehman, Richard F.: *See*—
Rees, James D.; and Lehman, Richard F., 4,118,122, Cl. 355-77.000.

Lehmann, Helmut: *See*—
Christ, Alfred; Lehmann, Helmut; Kantor, Ludwig; and Miller, Helmut, 4,118,040, Cl. 277-75.000.

Lehmann, Klaus: *See*—
Voelger, Karl-Dieter; Rietzel, Christian; and Lehmann, Klaus, 4,118,492, Cl. 424-251.000.

Leibundgut, Gottfried, to Robert Bosch GmbH. Multiple-function, hand-actuated switch unit, particularly for electrical hand tools or appliances and the like. 4,118,614, Cl. 200-157.000.

Leibundgut, Gottfried, to Robert Bosch GmbH. Hand-actuated, multiple-function switch unit, particularly for electrical hand tolls, appliances and the like. 4,118,615, Cl. 200-157.000.

Leidy, James Albert; and Porta, Gary Douglas, to AMP Incorporated. Double-ended connecting device. 4,118,103, Cl. 339-98.000.

Leiter, Herbert; and Reinheimer, Gunter, to Ernst Leitz Wetzlar GmbH. Microscope attachment camera. 4,118,719, Cl. 354-79.000.

Leith, Emmett N., to Environmental Research Institute of Michigan. Fiber optic phase correction using holograms. 4,118,106, Cl. 350-96.250.

Lemaire & Cie: *See*—
Renaut, Henry, 4,117,699, Cl. 68-5.00D.

Lemelson, Jerome H. Machine tool and method. 4,118,139, Cl. 408-12.000.

Lemelson, Jerome H. Scanning apparatus and method. 4,118,730, Cl. 358-93.000.

Lender, Adam, to GTE Automatic Electric Laboratories, Incorporated. Error correction for signals employing the modified duobinary code. 4,118,686, Cl. 340-146.1AB.

Lenihan, Thomas Francis, to RCA Corporation. Single wire transmission of multiple switch operations. 4,118,700, Cl. 340-524.000.

Lenoir, John: *See*—
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,118,232, Cl. 96-99.000.

Leonard, Charles R.: *See*—
Dannelly, Clarence C.; and Leonard, Charles R., 4,117,801, Cl. 118-20.000.

Lequeux, Christian: *See*—
Nakache, Robert; and Lequeux, Christian, 4,117,704, Cl. 72-83.000.

Lerch, Ulrich: *See*—
Kunstmann, Rudolf; Lerch, Ulrich; and Gerhards, Hermann, 4,118,497, Cl. 424-267.000.

Les Cables de Lyon: *See*—
Gauthier, Francis; and Mignien, Georges, 4,118,618, Cl. 219-121.00P.

Lescoa, Inc.: *See*—
Mansel, Orin C., 4,118,134, Cl. 403-282.000.

Lese, Henri K.: *See*—
Frayer, James Albert; Lese, Henri K.; McKinney, Joel Drexler; Metzer, Kirk J.; and Paraskos, John Angelo, 4,118,310, Cl. 208-210.000.

Le Sergent, Christian; and Liegois, Michel, to Compagnie Generale d'Electricite. Method and device for depositing a layer of glass on the inner wall of a tube. 4,117,802, Cl. 118-48.000.

Lesher, George Y., to Sterling Drug Inc. Cyclic alkylidenyl N-(lower-alkyl)-3-(pyridinyl)anilinomethylenemalonates. 4,118,557, Cl. 542-420.000.

Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 4-Acylamino-2-(pyridinyl)pyrimidine derivatives. 4,118,571, Cl. 544-319.000.

Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, to Saint-Gobain Industries. Method and apparatus for fiberizing attenuable materials and product thereof. 4,118,213, Cl. 65-5.000.

Levine, Lawrence J.: *See*—
Rovin, Herman; Levine, Lawrence J.; Opuszenski, Theodore; Pellicano, Joseph; and Swenson, Alan F., 4,117,789, Cl. 112-181.000.

Levine, Samuel R.; Singh, Shanker; and Weinberger, Arnold, to International Business Machines Corporation. Integrated binary-BCD look-ahead adder. 4,118,786, Cl. 364-783.000.

Levrai, Roland: *See*—
Carre, Jean-Jacques; and Levrai, Roland, 4,117,769, Cl. 91-170.00R.

Levy, Julienne, to Telettra International Process and machine for smoothing printed wiring-circuit plates. 4,117,913, Cl. 90-15.100.

Lewer, Gregory S.: *See*—
Anderson, Raymond H.; and Lewer, Gregory S., 4,118,114, Cl. 353-38.000.

Lewis, Donald R.: *See*—
Linde, John P.; Kopinski, Martin W.; and Lewis, Donald R., 4,117,617, Cl. 42-1.00S.

Li, Yao T., to Massachusetts Institute of Technology. Wheel torque feedback controlled front brake. 4,117,909, Cl. 188-2.00A.

Liang, Charles Chi; and Joshi, AshokVenimadhav, to P.R. Mallory & Co. Inc. Solid state cell with conductive layer between electrode and electrolyte. 4,118,549, Cl. 429-191.000.

LICENTIA Patent-Verwaltungs-GmbH: *See*—
Oberreuter, Theodor; Schimmer, Rigobert; and Seifert, Wilhelm, 4,118,257, Cl. 148-187.000.

Liebhold, Martin R.: *See*—
Johnson, Jerry Lynn; and Liebhold, Martin R., 4,118,089, Cl. 312-351.000.

Liegois, Michel: *See*—
Le Sergent, Christian; and Liegois, Michel, 4,117,802, Cl. 118-48.000.

Liermann, Traugott; and Dietrich, Karl-Heinz, to AGFA-Gevaert AG. Continuous microfilm camera. 4,118,121, Cl. 355-75.000.

Lim, Gary M. F.; and Perron, Yvon G., to Bristol-Myers Company. Production of 7-(2-aminomethylphenylacetamido-3-(1-carboxymethyltetrazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid. 4,118,563, Cl. 544-26.000.

Lin, Yang-I: *See*—
Lang, Stanley Albert, Jr.; Fabio, Paul Frank; Lin, Yang-I; Murdock, Keith Chadwick; and Fields, Thomas Lynn, 4,118,498, Cl. 424-267.000.

Linde, John P.; Kopinski, Martin W.; and Lewis, Donald R., to Remington Arms Company, Inc. Adjustable sighting rib. 4,117,617, Cl. 42-1.00S.

Lindner, Christian; Suling, Carlhans; Arend, Gunter; Brokmeier, Dieter; and Nischk, Gunther, to Bayer Aktiengesellschaft. Crosslinkable polyacrylonitrile copolymers. 4,118,375, Cl. 526-240.000.

Lindsay, William Roy Mackintosh, to Gyrac Engineering Products Limited. Wire rope slings. 4,118,059, Cl. 294-74.000.

Ling, Rujira Srisuthep: *See*—
Hoseney, Russell C.; and Ling, Rujira Srisuthep, 4,118,514, Cl. 426-62.000.

Linse, Vonne D.: *See*—
Green, Sheryll C.; and Linse, Vonne D., 4,117,966, Cl. 228-2.500.

Lipp, Alfred: *See*—
Schmitt-Thomas, Karlheinz G.; Lipp, Alfred; and Schwetz, Karl, 4,118,256, Cl. 148-160.000.

Lippmann, Wilbur, to American Home Products Corporation. Method of treating hyperchlorhydria and/or associated conditions with 1,3-dioxo-1H-benz(de)isoquinoline-2-(3H)-acetic acid. 4,118,493, Cl. 424-258.000.

Lippmann, Wilbur, to Ayerst, McKenna & Harrison Limited. Method of treating hyperglucagonemia with 1,3-dioxo-1H-benz[de]-isoquinoline-2(3H)-acetic acid. 4,118,495, Cl. 424-258.000.

Lippmann, Wilbur: *See*—
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,118,511, Cl. 424-330.000.

Lloyd, Donald E. Drill bit. 4,117,897, Cl. 175-106.000.

Lobbe, Johannes: *See*—
Exler, Petrus Andre Theodorus; and Lobbe, Johannes, 4,118,209, Cl. 62-176.00D.

Loctite Corporation: *See*—
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,118,442, Cl. 260-885.000.

Loeffler, Herbert H., to Woodstream Corporation. Animal trap including spring-engaging inertial snubber to reduce initial jaw impact. 4,117,621, Cl. 43-88.000.

Loeffler, Herbert H., to Woodstream Corporation. Low impact animal trap. 4,117,622, Cl. 43-88.000.

Loev, Bernard: *See*—
Brenner, L. Martin; and Loev, Bernard, 4,118,567, Cl. 544-131.000.

Logemann, Willy: *See*—
Giraldi, PierNicola; Nannini, Giuliano; Logemann, Willy; Tommasini, Raffaele; Buttinoni, Ada; and Biasoli, Giovanni, 4,118,504, Cl. 424-274.000.

Loges, Hans: *See*—
Ruf, Erich; and Loges, Hans, 4,118,293, Cl. 204-93.000.

Login, Robert B., to BASF Wyandotte Corporation. Spin-finish lubricating method. 4,118,326, Cl. 252-8.600.

Loraas, Orlan J.: *See*—
Beckstrom, Harold K.; Bauer, James J.; Morehouse, James O.; and Loraas, Orlan J., 4,117,944, Cl. 214-131.00A.

L'Oreal: *See*—
Vanlerberghe, Guy; and Rosenbaum, Georges, 4,118,423, Cl. 260-584.00A.

Lorre, Jean-Marie: *See—*
Guignard, Jean; and Lorre, Jean-Marie, 4,117,600, Cl. 33-133.000.

Losert, Wolfgang: *See—*
Philippson, Rainer; Krieger, Bernhard; Casals-Stenzel, Jorge; Kerb, Ulrich; Losert, Wolfgang; Prezewowsky, Klaus; Wiechert, Rudolf; and Bittler, Dieter, 4,118,488, Cl. 424-238.000.

Losev, Viktor Vasilievich: *See—*
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Zjukin, Nikolai Stepanovich; Kostjuk, Boris Dmitrievich; Shaikevich, Stanislava Stanislavovna; Motsak, Yaroslav Feodosievich; Fedulaev, Vitaly Pavlovich; Kolchemanov, Nikolai Alexandrovich; Ugarov, Valentin Mikhailovich; Losev, Viktor Vasilievich; Drui, Mark Simonovich; Lavrinovich, Alla Alexandrovna; Shpotakovsky, Dmitry Fedorovich; and Chizhov, Stanislav Viktorovich, 4,117,968, Cl. 228-124.000.

Lowry, Blaine E., to Raybestos Manhattan, Inc. Glass fiber friction facing. 4,118,528, Cl. 428-65.000.

Lozar, Giorgio; and Favale, Renato, to Indesit Industria Elettrodomestici Italiana S.p.A. Telescopic aerial with friction retaining sleeves. 4,118,708, Cl. 343-901.000.

Lubbehusen, Paul, to Waeschle Maschinenfabrik GmbH. Bulk material delivery apparatus. 4,118,075, Cl. 302-53.000.

Lubrizol Corporation, The: *See—*
Jahnke, Richard William, 4,118,331, Cl. 252-32.70E.

Lucas Industries Limited: *See—*
Mowbray, Dorian Farrar, 4,118,155, Cl. 417-462.000.
Preece, Kenneth; and Cheary, Walter Graham, 4,117,793, Cl. 113-116.00D.

Luckan, Johannes; Elwart, Jan; and Herter, Martin, to Ionit Anstalt Bernhad Berghaus. Frame for the support of articles which are to be treated. 4,118,624, Cl. 250-326.000.

Luczynski, Kazimierz. Spare wheel and tire holder. 4,117,963, Cl. 224-42.10B.

Lugscheider, Erich: *See—*
Knotek, Otto; Lugscheider, Erich; and Wichert, Wolfgang, 4,118,254, Cl. 148-32.000.

Luig, Heribert. Nuclear medicine diagnostic instrument for the determination of the distribution pattern of a radioactive radiation source. 4,118,632, Cl. 250-513.000.

Lukyanenko, Vladimir Matveevich: *See—*
Burin, Viktor Leontievich; Tjutjunnikov, Anatoly Borisovich; Golosov, Viktor Nikolaevich; Tarynin, Evgeny Konstantinovich; Pogorely, Nikolai Pavlovich; and Lukyanenko, Vladimir Matveevich, 4,118,446, Cl. 261-114.0VT.

Lund, Arnold S.; and Stroh, Thomas L., to Cadillac Rubber & Plastics, Inc. Coextrusion die. 4,118,167, Cl. 425-463.000.

Lundberg, Robert D., to Exxon Research & Engineering Co. Method for controlling viscosity of organic liquids. 4,118,361, Cl. 260-31.80G.

Lupkas, Raymond R. Solar energy collector. 4,117,832, Cl. 126-271.000.

Macke, Thomas F. Caliper stitch and trim machine. 4,118,023, Cl. 270-54.000.

Mackintosh, Brian H.; and Jewett, David N., to Mobil Tyco Solar Energy Corp. Cartridge and furnace for crystal growth. 4,118,197, Cl. 422-246.000.

Madsen, Per Johan: *See—*
Stannow, Jorgen Christian; Kjeldsen, Kjeld; Tankréd, Hans Jurgen; and Madsen, Per Johan, 4,118,153, Cl. 417-363.000.

Magee, Thomas A., to Diamond Shamrock Corporation. Ketoxime carbamates. 4,118,389, Cl. 260-294.80R.

Maget, Henri Jean Robert. Electrochemical water desalination process. 4,118,299, Cl. 204-180.00P.

Magnuson, John Edwin: *See—*
Christison, Sommerville Grant; Magnuson, John Edwin; and Tham, Wing Chong, 4,118,013, Cl. 254-187.500.

Mahan, John E.: *See—*
Fahey, Darryl R.; and Mahan, John E., 4,118,408, Cl. 260-439.00R.

Mailey, Everett A.: *See—*
Popoff, Ivan Christoff; Mailey, Everett A.; and Haines, Paul Gordon, 4,118,378, Cl. 526-36.000.

Maiorano, Dominick J., to Xerox Corporation. Facetted edge fadeout reflector. 4,118,119, Cl. 355-11.000.

Makowski, Henry S.; and O'Farrell, Charles P., to Exxon Research & Engineering Co. Elastomeric compositions. 4,118,353, Cl. 260-28.50B.

Makowski, Henry S.; and O'Farrell, Charles P., to Exxon Research & Engineering Co. Oil extended elastomeric compositions. 4,118,360, Cl. 260-31.20R.

Makowski, Henry S.; and Brenner, Douglas, to Exxon Research & Engineering Co. Plasticization of neutralized sulfonated elastomeric polymer. 4,118,362, Cl. 260-32.60A.

Malafosse, Jean, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for the preparation of sodium percarbonate as regular rhombohedral crystals. 4,118,465, Cl. 423-415.00P.

Malaysian Rubber Producers Research Association, The: *See—*
Dawes, Keith; and Rowley, Roger James, 4,118,367, Cl. 260-42.370.

Mallon, Robert T.: *See—*
Cornelius, James W.; and Mallon, Robert T., 4,117,798, Cl. 118-4.000.

Malofsky, Bernard M.: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,118,442, Cl. 260-885.000.

Mangel, Edward L.: *See—*
Regelson, Ephraim; Terral, Leonard G.; Matusiak, Ronald J.; Trotter, Jerry L.; Rea, William L.; and Mangel, Edward L., 4,117,967, Cl. 228-20.000.

Mannesmann Aktiengesellschaft: *See—*
Gruner, Hans; Terjung, Klaus; Sachse, Wolfgang; and Romerswinkel, Heinrich-Wilhelm, 4,118,018, Cl. 266-275.000.

Manning, William P., to Combustion Engineering, Inc. Convection baffles. 4,117,806, Cl. 122-33.000.

Mansel, Orin C., to Lescoa, Inc. Fastener joint and method thereof. 4,118,134, Cl. 403-282.000.

Manufacture de Produits Chimiques Protex, Societe Anonyme: *See—*
Balland, Jean, 4,118,538, Cl. 428-425.000.

Maravich, Rudolph. Electronic thermometer. 4,117,723, Cl. 73-362.0AR.

Marchetti, Francis R.; Zentz, William E.; and Berube, Richard R., to Engelhard Minerals & Chemicals Corporation. Suspensions of reactive acidic clay pigments. 4,118,247, Cl. 106-308.00N.

Marianeschi, Edmondo G. A.: *See—*
Barisoni, Mario; Barteri, Massimo; Ricci-Bitti, Roberto; Marianeschi, Edmondo G. A.; Basevi, Sandro C.; Borgianni, Carlo; and Santafe, Carlo, 4,118,255, Cl. 148-111.000.

Mark Controls Corporation: *See—*
Carlson, Donald E., 4,117,856, Cl. 137-62.000.

Markley, Theodore J.: *See—*
Casto, Walter V.; DeLong, Lawrence W.; Markley, Theodore J.; and Struger, Odo J., 4,118,789, Cl. 364-900.000.

Markon Engineering Company Limited: *See—*
Fleming, Francis William; and Pethick, Raymond John, 4,118,646, Cl. 310-58.000.

Marra, Dorothea C.: *See—*
Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C., 4,117,958, Cl. 222-402.180.

Marse, Salvador. President election game. 4,118,036, Cl. 273-257.000.

Marshall, Henry Bruce: *See—*
Crawford, Ian Drummond; Marshall, Henry Bruce; and Cormack, Robert John, 4,118,109, Cl. 350-285.000.

Martin, Charles Francis. Submarine pipe trenching apparatus. 4,117,689, Cl. 405-163.000.

Martin, Herman H., Jr., to Outboard Marine Corporation. Lawn mower with cutter blade interlock. 4,117,651, Cl. 56-10.500.

Martini, Thomas, to Hoechst Aktiengesellschaft. Perfluorinated ethers. 4,118,398, Cl. 260-340.600.

Martini, Thomas, to Hoechst Aktiengesellschaft. Process for preparing perfluoro-α-(3,6-dimethyl-1,4-dioxanyl-2-oxy)-propionic acid fluoride. 4,118,399, Cl. 260-340.200.

Martini, Thomas, to Hoechst Aktiengesellschaft. Process for the manufacture of perfluoro-alkoxy-propionic acid fluorides. 4,118,421, Cl. 260-544.00F.

Martynova, Marina Alexandrovna: *See—*
Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,118,432, Cl. 260-683.15D.

Marwitz, Hans-Gunther v.d., to Bayerische Motoren Werke AG. Cast spoke-wheel for motor vehicles, especially motorcycles. 4,118,073, Cl. 301-6.0CS.

Marze, Xavier, to Rhone-Poulenc S.A. Polyelectrolytes. 4,118,439, Cl. 260-858.000.

Masa, Gunter: *See—*
Klein, Hans-Joachim; Rupprecht, Manfred; Wonneberg, Heinz; Geiger, Julius; and Masa, Gunter, 4,118,127, Cl. 356-200.000.

Massachusetts Institute of Technology: *See—*
Klein, Fritz S.; and Ross, John, 4,118,296, Cl. 204-157.10R.
Li, Yao T., 4,117,909, Cl. 188-2.00A.

Masso Remiro, Jose Maria, to Turbo, S.A. Monopiece face mask for beauty treatment. 4,117,837, Cl. 128-76.00B.

Masuda, Shigeyuki: *See—*
Nakao, Hideyuki; Kasai, Yasuhiro; Ikehata, Yukio; Masuda, Shigeyuki; Obara, Nobuo; and Nishida, Isamu, 4,117,665, Cl. 58-106.500.

Mather, Joseph M.: *See—*
Sagaser, Thomas M.; and Mather, Joseph M., 4,117,899, Cl. 180-6.480.

Mathys, Pierre, to Bouchet-Lassale S.A. Pivoting device for a watch barrel. 4,117,664, Cl. 58-86.000.

Matsubara, Hiroshi, to Diesel Kiki Co., Ltd. Vehicle speed control system. 4,117,904, Cl. 180-108.000.

Matsuda, Kiyofumi, to Agency of Industrial Science & Technology. Holographic shearing interferometer. 4,118,124, Cl. 356-107.000.

Matsuda, Tetsuo: *See—*
Morishita, Masataka; Yokokawa, Yasuo; Nishikawa, Tokio; Mishiro, Masahiro; Ohashi, Shigeyasu; Fukushima, Mitsuru; Inaba, Yoshihito; and Matsuda, Tetsuo, 4,118,336, Cl. 252-316.000.

Matsui, Sei, to Nippon Kogaku K.K. Optical system for indication in the viewfinder of single-lens reflex camera. 4,118,722, Cl. 354-155.000.

Matsui, Shigeru: *See—*
Miyasaka, Tsutomu; Fujimori, Yoshiaki; Matsui, Shigeru; and Komaki, Tetsuo, 4,117,658, Cl. 58-90.00R.

Matsui, Takeshi; and Arakawa, Kunihiko, to Toyo Boseki Kabushiki Kaisha. Transparent non-blocking polypropylene film and its preparation. 4,118,438, Cl. 260-857.00L.

Matsumaru, Shizuo: *See—*
Ishibashi, Kazufumi; Matsumaru, Shizuo; and Ichimura, Takeo, 4,118,238, Cl. 106-47.00Q.

Matsumoto, Hiromitsu: *See*—
Yamashita, Ryuichi; and Matsumoto, Hiromitsu, 4,117,813, Cl. 123-119.00R.

Matsuo, Takashi: *See*—
Kitamura, Shigeyoshi; Itaya, Nobushige; Okuno, Yoshitoshi; Ohno, Nobuo; Matsuo, Takashi; Hirano, Masachika; Mizutani, Toshio; and Takeda, Hisami, 4,118,505, Cl. 424-275.000.

Matsushita Electronics Corporation: *See*—
Kano, Gota; and Iwasa, Hitoo, 4,117,587, Cl. 29-571.000.

Matsushita, Nobuaki: *See*—
Harada, Hideo; and Matsushita, Nobuaki, 4,118,354, Cl. 260-29.2TN.

Matsuura, Haruo; and Kawahara, Kiyoshi, to Star Seimitsu Kabushiki Kaisha. Single lever operated cassette tape recorder. 4,118,745, Cl. 360-96.000.

Matsuura, Hiroshi: *See*—
Oku, Kyoichi; and Matsuura, Hiroshi, 4,118,271, Cl. 162-31.000.

Matsuzawa, Hideo: *See*—
Ishii, Kazuhiro; Matsuzawa, Hideo; Kobayashi, Masao; and Ishii, Hiromichi, 4,118,419, Cl. 562-534.000.

Matteson, Edward J.: *See*—
Ziegler, Bertram Randall; and Matteson, Edward J., 4,118,272, Cl. 162-156.000.

Matusiak, Ronald J.: *See*—
Regelson, Ephraim; Terral, Leonard G.; Matusiak, Ronald J.; Trotter, Jerry L.; Rea, William L.; and Mangel, Edward L., 4,117,967, Cl. 228-20.000.

Matuzaki, Takeshi; Goto, Masuo; and Momochi, Yasushi, to Hitachi, Ltd. Field overvoltage protecting apparatus for synchronous machine. 4,118,749, Cl. 361-33.000.

Maurer, Fritz; Riebel, Hans-Jochem; Behrenz, Wolfgang; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Combating arthropods with O-methyl-O-n-propyl-O-(2-carbalkoxy-2-alkoxy-vinyl)-thionophosphoric acid esters. 4,118,486, Cl. 424-212.000.

Maus, Dieter; and Buck, Hermann, to Bielomatik Leuze & Co. Device for spreading glue. 4,117,800, Cl. 118-7.000.

Max-Planck-Gesellschft zur Forderung der Wissenschaften e.V.: *See*—
Voigt, K. J., 4,118,105, Cl. 350-96.200.

May, Adolf: *See*—
Steckelberg, Willi; Panke, Hans Ludwig; May, Adolf; and Bucking, Hans-Walter, 4,118,324, Cl. 252-8.900.

Mayama, Masayoshi; Terada, Sadatugu; Muramatsu, Toshio; Kimura, Masayuki; Ishibara, Masao; and Kobayashi, Tohru, to Konishiroku Photo Industry Co., Ltd.; and Hokuetsu Paper Mills Ltd. Light-sensitive silver halide photographic materials containing antistatic agents. 4,118,231, Cl. 96-87.00A.

Mayer, Alfred: *See*—
Shwartzman, Stanley; and Mayer, Alfred, 4,118,649, Cl. 310-337.000.

Mayer, Endre A., to Bendix Corporation, The. Rotary compressor. 4,118,157, Cl. 418-1.000.

Mayer, Hubert: *See*—
Rupp, Ludwig; and Mayer, Hubert, 4,117,919, Cl. 192-103.00A.

Mayer, Peter; Blair, Robert W.; and Zamin, Mohammed, to Heritage Silversmiths Limited. Apparatus for electrochemical finishing of stainless steel. 4,118,301, Cl. 204-202.000.

Mayer, Rolf: *See*—
Bohm, Gerhard; and Mayer, Rolf, 4,117,866, Cl. 138-30.000.

MCA Disco-Vision, Inc.: *See*—
Wilkinson, Richard L., 4,118,735, Cl. 358-128.000.

McAdams, Timothy E.: *See*—
Struger, Odo J.; McAdams, Timothy E.; and Dummermuth, Ernst, 4,118,792, Cl. 364-900.000.

McAleer, William J.; and Wasmuth, Edward H., to Merck & Co., Inc. Hepatitis B antigen. 4,118,477, Cl. 424-89.000.

McArthur, Colin Shaw; and Clark, Douglas Copeland, to R. J. Reynolds Tobacco Company. Rotary beam chopper and scanning system. 4,118,619, Cl. 219-121.00L.

McCleskey, Robert W., Jr.; Putnam, Paul S.; and Boltad, Arne Martin, to Golar-Nor Offshore A/S. Device for handling and racking riser pipes and drill pipes. 4,117,941, Cl. 214-2.500.

McClure, Marvin K.: *See*—
Burg, John S.; Davidson, Donald M.; McClure, Marvin K.; and Sannel, Benjamin H., 4,117,604, Cl. 34-70.000.

McDonnell Douglas Corporation: *See*—
Charles, Ronald A.; Jones, Paul W.; Staples, John L.; and Wiegner, Joseph R., 4,118,280, Cl. 195-127.000.

McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., to American Hoechst Corporation. Preparation of 6,11-dihydro-11-oxodibenz[b,e]oxepin-2-acetic acid and precursors therefor. 4,118,401, Cl. 260-333.000.

McGroddy, Peter M., to Lawler, Matusky & Skelly Engineers. Apparatus and method for sampling water for fish larvae and other trophic levels. 4,117,726, Cl. 73-421.00R.

McIntire, John E.: *See*—
McIntire, Kendrick H.; and McIntire, John E., 4,117,824, Cl. 126-15.00R.

McIntire, Kendrick H.; and McIntire, John E. Automatic wood burning heating stove. 4,117,824, Cl. 126-15.00R.

McKenna, Charles M.; and Mueller, Wolfgang F., to International Business Machines Corporation. Ion implantation apparatus with a cooled structure controlling the surface potential of a target surface. 4,118,630, Cl. 250-492.00A.

McKeon, John F., to FMC Corporation. Chain for engagement with double sprocket. 4,117,738, Cl. 74-250.00R.

McKinney, Joel Drexler: *See*—
Frayer, James Albert; Lese, Henri K.; McKinney, Joel Drexler; Metzer, Kirk J.; and Paraskos, John Angelo, 4,118,310, Cl. 208-210.000.

Mc Partland, Richard J.; Foster, F. Gordon; and Kupfer, David J. Physiological motor activity monitoring apparatus. 4,117,834, Cl. 128-2.00S.

McPeak, Walter G.; and Myhand, James K. Horizontally adjustable curtain rods for bathroom stalls. 4,117,557, Cl. 4-149.000.

McWaters, Lynn D.; and Parekh, Hersh B., to Recognition Equipment Incorporated. Portable OCR system. 4,118,687, Cl. 340-146.3ED.

Mead Corporation, The: *See*—
Wood, Prentice J., 4,117,925, Cl. 206-186.000.

Meador, D. John: *See*—
Lazet, Frank J.; Meador, D. John; and Webster, Richard G., 4,118,463, Cl. 423-334.000.

Medcraft, Wayne R., to Belden Corporation. Combination cutting and crimping tool. 4,117,711, Cl. 72-413.000.

Meier, Heinz; Zurawski, Egon; and Greppmaier, Paul, to Triumph Werke Nurnberg A.G. Gear drives with direction of rotation reversal. 4,117,739, Cl. 74-404.000.

Meier, John: *See*—
Noir, Dominique; and Meier, John, 4,118,172, Cl. 431-12.000.

Melsunger Metall-Werk, Erwin Drescher: *See*—
Drescher, Erwin, 4,117,785, Cl. 109-59.00T.

Melvin, Lawrence Sherman, Jr.: *See*—
Johnson, Michael Ross; and Melvin, Lawrence Sherman, Jr., 4,118,559, Cl. 542-432.000.

Merck & Co., Inc.: *See*—
McAleer, William J.; and Wasmuth, Edward H., 4,118,477, Cl. 424-89.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Krause, Joachim; Streinstrasser, Ralf; Pohl, Ludwig; Del Pino, Fernando; and Weber, Georg, 4,118,335, Cl. 252-299.000.

Merger, Franz: *See*—
Fouquet, Gerd; Merger, Franz; Platz, Rolf; and Baer, Karl, 4,118,588, Cl. 560-210.000.

Merkel, Wulf: *See*—
Bormann, Dieter; Merkel, Wulf; and Muschaweck, Roman, 4,118,397, Cl. 260-326.410.

Merlin Gerin: *See*—
Nebon, Jean-Pierre; and Morel, Robert, 4,118,681, Cl. 335-195.000.

Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Spies, Johann; and Wohrl, Alfons, 4,117,730, Cl. 73-517.00R.

Mesta Machine Company: *See*—
Petros, Andrew J., 4,117,989, Cl. 242-78.800.

Metalimphy & B.V.S.: *See*—
Lagarde, Pierre; and Denoor, Gaston, 4,117,584, Cl. 29-452.000.

Metcalf, Robert L.; and Coats, Joel R., to University of Illinois Foundation. Biodegradable insecticides. 4,118,424, Cl. 260-613.00R.

Metzer, Kirk J.: *See*—
Frayer, James Albert; Lese, Henri K.; McKinney, Joel Drexler; Metzer, Kirk J.; and Paraskos, John Angelo, 4,118,310, Cl. 208-210.000.

Meyn, Pieter. Apparatus for cutting out the vent of a fowl. 4,117,570, Cl. 17-11.000.

Michaely, William James, to FMC Corporation. Process for preparing 2,3-dihydro-7-benzofuranols and benzodioxole intermediate therefor. 4,118,400, Cl. 260-340.500.

Michel, Alwin Earl: *See*—
Horng, Cheng Tzong; Michel, Alwin Earl; Rupprecht, Hans Stephan; and Schwenker, Robert Otto, 4,118,250, Cl. 148-1.500.

Microtherm GmbH, Firma: *See*—
Schwarz, Gerhard, 4,118,683, Cl. 337-91.000.

Middleton, Charles A.; and Middleton, Trudy B., to TCM Corporation. Utility desk. 4,117,781, Cl. 108-11.000.

Middleton, Trudy B.: *See*—
Middleton, Charles A.; and Middleton, Trudy B., 4,117,781, Cl. 108-11.000.

Midwest Research Institute: *See*—
Goodson, Louis H.; and Jacobs, William B., 4,117,714, Cl. 73-23.000.

Mignien, Georges: *See*—
Gauthier, Francis; and Mignien, Georges, 4,118,618, Cl. 219-121.00P.

Mikata, Yoshitaka, to Yamato Scale Company, Ltd. Tray loading device in continuous conveying and processing system. 4,117,921, Cl. 198-482.000.

Miki, Kyosuke; and Takeuchi, Masahiro, to Sumitomo Bakelite Company Limited. Method for producing transparent plastic molded articles. 4,118,454, Cl. 264-93.000.

Mild, William M., to Wagner Electric Corporation. Control valve having reduced crack-open pressure. 4,118,076, Cl. 303-6.00C.

Miles Laboratories, Inc.: *See*—
Johnson, Leighton Clifford, 4,117,728, Cl. 73-425.600.

Miller, Barry: *See*—
Chang, Kuang-Chou; Heller, Adam; and Miller, Barry, 4,118,548, Cl. 429-111.000.

Miller, George A.; and Chan, Hak-Foon, to Rohm and Haas Company. 1-Substituted aralkyl imidazoles. 4,118,461, Cl. 424-273.00R.

Miller, Helmut: *See*—
Christ, Alfred; Lehmann, Helmut; Kantor, Ludwig; and Miller, Helmut, 4,118,040, Cl. 277-75.000.

Miller, Lawrence A.: *See*—
Hanley, Michael A.; Miller, Lawrence A.; and Kinsey, Irvin H., 4,118,345, Cl. 260-2.300.

Milligan, James W., to Duncan Electric Co., Inc. Method for making a heat sensitive fault detecting and indicating device for watthour meter. 4,118,667, Cl. 324-110.000.

Milliken Research Corporation: *See*—
Engels, Walter, 4,117,576, Cl. 26-9.000.
Gilpatrick, Michael William; and Engels, Walter, 4,117,577, Cl. 26-9.000.
Ingham, Robert M., Jr., 4,117,656, Cl. 57-157.0TS.

Mills, J. T., to Sentinel Distributors, Inc. Engine protective device with restricted manual override. 4,117,822, Cl. 123-198.0DB.

Mills, John A.: *See*—
Salva, John P.; Mudzinski, Gregory M.; Mills, John A.; and Dewan, Shashi B., 4,118,658, Cl. 318-257.000.

Milner, David John: *See*—
Cleare, Peter John Vernon; Kaye, Albert Edward; and Milner, David John, 4,118,412, Cl. 260-464.000.

Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corporation. 2,2,6,6-Tetrasubstituted-4-piperidyl carboxy heterocyclic compounds as stabilizers for synthetic polymers. 4,118,369, Cl. 260-45.80N.

Mining Equipment Division, a division of FMC Corporation: *See*—
Saunders, Daniel, 4,117,894, Cl. 173-23.000.

Minnesota Mining and Manufacturing Company: *See*—
Anderson, Raymond H.; and Lewer, Gregory S., 4,118,114, Cl. 353-38.000.
Beardsley, James L.; and Zollinger, J. Lamar, 4,118,536, Cl. 428-413.000.
Doering, Arlin B.; and Volness, Kenneth H., 4,118,748, Cl. 360-133.000.
Hauser, Edward R., 4,118,531, Cl. 428-224.000.
Hsu, Grace F., 4,118,289, Cl. 204-43.00S.

Minolta Camera Kabushiki Kaisha: *See*—
Kuramoto, Yoshio; Ueda, Hiroshi; and Uesugi, Kyozo, 4,118,726, Cl. 354-289.000.
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, 4,118,724, Cl. 354-266.000.
Yamazaki, Keiji; and Katsuragi, Mamoru, 4,118,723, Cl. 354-155.000.

Minoura, Mikio, to Aisan Industry Co., Ltd. Exhaust gas recirculating system for use in internal combustion engine. 4,117,816, Cl. 123-119.00A.

Mishiro, Masahiro: *See*—
Morishita, Masataka; Yokokawa, Yasuo; Nishikawa, Tokio; Mishiro, Masahiro; Ohashi, Shigeyasu; Fukushima, Mitsuru; Inaba, Yoshihito; and Matsuda, Tetsuo, 4,118,336, Cl. 252-316.000.

Mita, Katuo: *See*—
Watanabe, Takeshi; Nishimaki, Kazuo; Shimanuki, Kazuo; Mita, Katuo; and Konno, Satoru, 4,118,210, Cl. 65-2.000.

Mitsubishi Chemical Industries Limited: *See*—
Sawai, Masanobu; Sudo, Tadamitsu; and Enomoto, Shogo, 4,118,192, Cl. 424-12.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Sugimoto, Sachirou; and Katsuki, Kanji, 4,118,770, Cl. 363-138.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Takahashi, Akira, 4,117,814, Cl. 123-119.00A.
Takamiya, Bonnosuke, 4,117,808, Cl. 123-75.00B.

Mitsubishi Light Metal Industries Limited: *See*—
Arita, Youji, 4,118,304, Cl. 204-243.00R.

Mitsubishi Rayon Company, Ltd.: *See*—
Ishii, Kazuhiro; Matsuzawa, Hideo; Kobayashi, Masao; and Ishii, Hiromichi, 4,118,419, Cl. 562-534.000.

Mitsui, Norihiko: *See*—
Nara, Toshihiko; Mitsui, Norihiko; and Shigeta, Masayuki, 4,117,908, Cl. 187-20.000.

Mitsui, Shigeo: *See*—
Ishibashi, Katsuji; Mitsui, Shigeo; and Kobayashi, Rikio, 4,118,341, Cl. 252-438.000.

Mitzlaff, Michael; Warning, Klaus; and Jensen, Harald, to Hoechst Aktiengesellschaft. Fungicidal alkoxy mono- and dialkoxy N-substituted cyclic amines. 4,118,500, Cl. 424-267.000.

Miwa, Kathuyoshi: *See*—
Yokoyama, Takushi; Kojima, Hidetaka; Uragami, Masaharu; and Miwa, Kathuyoshi, 4,118,388, Cl. 260-290.00R.

Miyagawa, Kazuo: *See*—
Ichijima, Isamu; Watanabe, Seiichi; and Miyagawa, Kazuo, 4,118,732, Cl. 358-101.000.

Miyake, Tetsuya: *See*—
Seko, Maomi; Miyake, Tetsuya; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, 4,118,457, Cl. 423-7.000.

Miyamoto, Minoru: *See*—
Shiohara, Tomoo; Miyamoto, Minoru; and Tamaki, Nobuo, 4,118,227, Cl. 106-306.000.

Miyamoto, Takayoshi: *See*—
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, 4,118,724, Cl. 354-266.000.

Miyamoto, Toshiyuki. Device for practicing golf swing. 4,118,033, Cl. 273-186.00A.

Miyanohara, Isao; Miyazaki, Hiroshi; and Kawamura, Hideo, to Toyo Soda Manufacturing Co., Ltd. Treatment of sludge. 4,118,319, Cl. 210-51.000.

Miyasaka, Tsutomu; Fujimori, Yoshiaki; Matsui, Shigeru; and Komaki, Tetsuo, to Kabushiki Kaisha Suwa Seikosha. Waterproof watch case. 4,117,658, Cl. 58-90.00R.

Miyazaki, Hiroshi: *See*—
Miyanohara, Isao; Miyazaki, Hiroshi; and Kawamura, Hideo, 4,118,319, Cl. 210-51.000.

Mizuno, Fumio; and Ishihara, Masamichi, to Hitachi, Ltd. Memory array with larger memory capacitors at row ends. 4,118,794, Cl. 365-149.000.

Mizuno, Toshihiko: *See*—
Uchida, Yoshiro; Mizuno, Toshihiko; Higuchi, Isao; Imai, Susumu; and Usui, Shyoichiro, 4,117,586, Cl. 29-568.000.

Mizusawa, Akira: *See*—
Sugiyama, Massaki; Yuda, Takuo; and Mizusawa, Akira, 4,118,323, Cl. 210-439.000.

Mizutani, Toshio: *See*—
Kitamura, Shigeyoshi; Itaya, Nobushige; Okuno, Yoshitoshi; Ohno, Nobuo; Matsuo, Takashi; Hirano, Masachika; Mizutani, Toshio; and Takeda, Hisami, 4,118,505, Cl. 424-275.000.

Mobay Chemical Corporation: *See*—
Reiff, Helmut F.; and Pantone, Richard S., 4,118,411, Cl. 260-453.0SP.

Mobil Oil Corporation: *See*—
Chen, Nai Yuen, 4,118,431, Cl. 260-668.00R.
Gross, Benjamin; and Schatz, Klaus Wilhelm, 4,118,337, Cl. 252-417.000.
Gross, Benjamin; and Schatz, Klaus Wilhelm, 4,118,338, Cl. 252-417.000.
Herrington, F. John, 4,118,453, Cl. 264-89.000.
Yan, Tsoung-Yuan, 4,118,201, Cl. 44-1.00R.
Yan, Tsoung-Yuan, 4,118,281, Cl. 201-2.500.

Mobil Tyco Solar Energy Corp.: *See*—
Mackintosh, Brian H.; and Jewett, David N., 4,118,197, Cl. 422-246.000.

Mochizuki, Atsushi: *See*—
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,117,703, Cl. 72-38.000.

Moen, A. M. D.: *See*—
Austin, Robert R.; and Moen, A. M. D., 4,117,725, Cl. 73-421.50R.

Mogami, Youetsu: *See*—
Yazane, Shigeru; and Mogami, Youetsu, 4,117,741, Cl. 74-492.000.

Mohr, Reinhard; and Hohmann, Kurt, to Hoechst Aktiengesellschaft. Process for dyeing and printing nickel-containing polyolefins. 4,118,185, Cl. 8-42.00D.

Moll, Franz: *See*—
Corluy, Hans Josephus; Moll, Franz; Muller, Herbert; and Hase, Marie, 4,118,228, Cl. 96-17.000.

Mollenhoff, Klaus, to Siemens Aktiengesellschaft. One piece fusible conductor for low voltage fuses. 4,118,684, Cl. 337-296.000.

Mollenkopf, Hans; Ritzmann, Horst; Wurr, Jurgen; Schmits, Heinz-Berbert; Heinemann, Otto; Krutzner, Karl, jun.; and Schossler, Werner, to Polysius AG. Heat treatment for fine-grained materials. 4,118,176, Cl. 432-14.000.

Mollere, John C., to Western Geophysical Co. of America. Linear ejection underwater charge launcher. 4,117,780, Cl. 102-22.00R.

Molls, Hans-Heinz; Schiwy, Willy; Hornle, Reinhold; and Nebeling, Reinhard, to Bayer Aktiengesellschaft. Process for preparation of azo dyestuffs by coupling in presence of aromatic sulphonic acid-formaldehyde reaction product. 4,118,384, Cl. 260-163.000.

Momochi, Yasushi: *See*—
Matuzaki, Takeshi; Goto, Masuo; and Momochi, Yasushi, 4,118,749, Cl. 361-33.000.

Monsanto Company: *See*—
Dobo, Emerick J., 4,118,225, Cl. 75-207.000.
Fields, Joseph E.; and Slocombe, Robert J., 4,118,554, Cl. 526-15.000.
Lannert, Kent P., 4,118,420, Cl. 562-583.000.
Le Blanc, John R., 4,118,441, Cl. 260-874.000.
Rapko, John N., 4,118,568, Cl. 544-173.000.
Sidebotham, Norman C.; Shoemaker, Paul D.; and Young, Clarence W., III, 4,118,187, Cl. 8-102.000.
Silver, Frank M.; and Bach, Hartwig C., 4,118,358, Cl. 260-30.80R.
Veazey, Thomas M., 4,118,190, Cl. 8-149.300.
White, James E., 4,118,403, Cl. 260-346.760.

Montedison S.p.A.: *See*—
Cassar, Luigi; and Gardano, Andrea, 4,118,589, Cl. 560-204.000.

Monticelli, Dennis M.; and Sleeth, Robert S., to National Semiconductor Corporation. Photo electric biased photo diode operational amplifier. 4,118,621, Cl. 250-214.00A.

Mooi, John, to Atlantic Richfield Company. Process for the isomerization of hydrocarbons. 4,118,430, Cl. 260-668.00A.

Moore, Doyle A., to Bedford Industries, Inc. Reel adapter for tie material and method of using the same. 4,117,988, Cl. 242-71.900.

Moore, Ray G.; and Coffman, William M., Jr., to Pope, Ivan, a part interest. Self-deodorizing litter box. 4,117,804, Cl. 119-1.000.

Moreau, Marc, to Trefimetaux. Process and apparatus for continuous heat treatment of metallic wires and bands. 4,118,617, Cl. 219-10.61R.

Morehouse, James O.: *See*—
Beckstrom, Harold K.; Bauer, James J.; Morehouse, James O.; and Loraas, Orlan J., 4,117,944, Cl. 214-131.00A.
Henline, John W.; Bauer, James J.; and Morehouse, James O., 4,117,902, Cl. 180-54.00R.

Morel, Robert: *See*—
Nebon, Jean-Pierre; and Morel, Robert, 4,118,681, Cl. 335-195.000.

Morelli, Amedeo John: *See*—
Francis, Gaylord Lee; and Morelli, Amedeo John, 4,117,589, Cl. 29-619.000.

Mori, Eizo; and Mori, Takao. Garden shears. 4,117,592, Cl. 30-135.000.

Mori, Takao: *See*—
Mori, Eizo; and Mori, Takao, 4,117,592, Cl. 30-135.000.
Mori, Toshinori: *See*—
Iwahara, Makoto; and Mori, Toshinori, 4,118,599, Cl. 179-1.00G.
Morimura, Syoji: *See*—
Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,118,368, Cl. 260-45.80N.
Morishima, Susumu: *See*—
Ito, Yukio; and Morishima, Susumu, 4,117,650, Cl. 53-587.000.
Morishita, Masataka; Yokokawa, Yasuo; Nishikawa, Tokio; Mishiro, Masahiro; Ohashi, Shigeyasu; Fukushima, Mitsuru; Inaba, Yoshihito; and Matsuda, Tetsuo, to Toyo Jozo Company, Ltd.; and Asahi Kasei Kogyo Kabushiki Kaisha. Novel cellulose microcapsules and preparation thereof. 4,118,336, Cl. 252-316.000.
Moriyama, Kenneth J., to Ventron Corporation. Electronic tare system for electrical balance. 4,117,898, Cl. 177-165.000.
Morley, Robert Arthur: *See*—
Kerr, Andrew Guy; and Morley, Robert Arthur, 4,118,012, Cl. 254-173.00R.
Morris, John McLean. Intrauterine device. 4,117,839, Cl. 128-130.000.
Morris, Leeson R.: *See*—
Horning, Donald E.; Morris, Leeson R.; and Douglas, James L., 4,118,566, Cl. 544-105.000.
Morton, Douglas Ross, Jr., to Upjohn Company, The. Inter-oxa-13,14-dihydro-9β-PGD$_1$ compounds. 4,118,415, Cl. 562-503.000.
Mosimann, Peter Hubert; and Sutter, Hans Rudolf, to Bulova Watch Company, Inc. Electronic watch with time correction system. 4,117,663, Cl. 58-85.500.
Motogi, Hideo: *See*—
Nakamura, Ryuji; and Motogi, Hideo, 4,118,450, Cl. 264-43.000.
Motoren- und Turbinen-Union Friedrichshafen GmbH: *See*—
Rupp, Ludwig; and Mayer, Hubert, 4,117,919, Cl. 192-103.00A.
Motoren- und Turbinen-Union Munchen GmbH: *See*—
Gothsche, Friedrich, 4,117,927, Cl. 206-319.000.
Motorola, Inc.: *See*—
Jarrett, Robert B.; and Zobel, Don W., 4,117,819, Cl. 123-148.00E.
Richardson, William Stanley, 4,118,642, Cl. 307-238.000.
Motsak, Yaroslav Feodosievich: *See*—
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Zjukin, Nikolai Stepanovich; Kostjuk, Boris Dmitrievich; Shaikevich, Stanislava Stanislavovna; Motsak, Yaroslav Feodosievich; Fedulaev, Vitaly Pavlovich; Kolchemanov, Nikolai Alexandrovich; Ugarov, Valentin Mikhailovich; Losev, Viktor Vasilievich; Drui, Mark Simonovich; Lavrinovich, Alla Alexandrovna; Shpotakovsky, Dmitry Fedorovich; and Chizhov, Stanislav Viktorovich, 4,117,968, Cl. 228-124.000.
Mowbray, Dorian Farrar, to Lucas Industries Limited. Fuel pumping apparatus. 4,118,155, Cl. 417-462.000.
Mowli, John C.; and Bala, Harry. Reclosable bag. 4,117,934, Cl. 206-610.000.
Mudzinski, Gregory M.: *See*—
Salva, John P.; Mudzinski, Gregory M.; Mills, John A.; and Dewan, Shashi B., 4,118,658, Cl. 318-257.000.
Mueller, Robert H. Exhaust hood with adjustable air injection nozzle. 4,117,833, Cl. 126-299.00D.
Mueller, Wolfgang F.: *See*—
McKenna, Charles M.; and Mueller, Wolfgang F., 4,118,630, Cl. 250-492.00A.
Mulach, Arthur: *See*—
Calfo, Raymond M.; Dailey, George F.; Alkire, Gerald R.; and Mulach, Arthur, 4,118,645, Cl. 310-53.000.
Mulhauser, Paul J.: *See*—
Spranger, Douglas M.; Brookes, Malcolm J.; and Mulhauser, Paul J., 4,118,048, Cl. 280-47.350.
Mulholland, Patrick John; and Thomas, Colin Arthur, to International Business Machines Corporation. Drive belt loading system. 4,117,737, Cl. 74-242.000.
Muller, Gerd: *See*—
Baurecht, Heinz-Ewald; Hornle, Reinhold; and Muller, Gerd, 4,118,391, Cl. 260-314.500.
Muller, Herbert: *See*—
Corluy, Hans Josephus; Moll, Franz; Muller, Herbert; and Hase, Marie, 4,118,228, Cl. 96-17.000.
Muller, Johann: *See*—
Wagner, Paul-Heinz; Hirtsiefer, Richard; and Muller, Johann, 4,117,735, Cl. 74-47.000.
Mumford, George V., to Owens-Illinois, Inc. Child-resistant safety closure. 4,117,945, Cl. 215-216.000.
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Masaharu; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Totally opened F. value information input system of lens for a camera with interchangeable lenses. 4,118,713, Cl. 354-23.00D.
Murakami, Hiroyashu: *See*—
Suzuki, Masayuki; Sakurada, Nobuaki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyashu, 4,118,716, Cl. 354-38.000.
Murakami, Noboru; and Furusawa, Choji, to Aisin Seiki Kabushiki Kaisha. Stator for a torque converter. 4,117,677, Cl. 60-345.000.
Murakami Screen Kabushiki Kaisha: *See*—
Tsunoda, Takahiro; and Yamaoka, Tsuguo, 4,118,233, Cl. 96-115.00P.
Murakami, Takao; Ishikawa, Yasuo; and Ito, Masahiro, to Tokico Ltd. Pump device. 4,118,151, Cl. 417-223.000.
Muramatsu, Akira: *See*—
Ohta, Takahiro; and Muramatsu, Akira, 4,118,654, Cl. 40-361.000.
Muramatsu, Toshio: *See*—
Mayama, Masayoshi; Terada, Sadatugu; Muramatsu, Toshio; Kimura, Masayuki; Ishibara, Masao; and Kobayashi, Tohru, 4,118,231, Cl. 96-87.00A.
Murdock, Keith Chadwick: *See*—
Lang, Stanley Albert, Jr.; Fabio, Paul Frank; Lin, Yang-I; Murdock, Keith Chadwick; and Fields, Thomas Lynn, 4,118,498, Cl. 424-267.000.
Murray, Christopher Linley; and Vale, Corwyn Philip, to British Industrial Plastics Limited. Terpolyamide hot melt adhesive. 4,118,351, Cl. 260-18.00N.
Murrmann, Helmuth; and Wittenzellner, Ernst, to Siemens Aktiengesellschaft. Process for the production of a locally high, inverse, current amplification in a planar transistor. 4,118,251, Cl. 148-1.500.
Murtha, Timothy P.; and Zuech, Ernest A., to Phillips Petroleum Company. Hydroalkylation using multimetallic zeolite catalyst. 4,118,434, Cl. 260-668.00R.
Musashi Kabushiki Kaisha: *See*—
Ito, Yukio; and Morishima, Susumu, 4,117,650, Cl. 53-587.000.
Muschaweck, Roman: *See*—
Bormann, Dieter; Merkel, Wulf; and Muschaweck, Roman, 4,118,397, Cl. 260-326.410.
Lang, Hans-Jochen; and Muschaweck, Roman, 4,118,501, Cl. 424-270.000.
Mustered, Lyle V., to Anthony Company. Self-propelled articulated vehicle. 4,117,901, Cl. 180-51.000.
Mustered, Lyle V., to Anthony Company. Steering system for articulated vehicles. 4,117,905, Cl. 180-139.000.
Mustered, Lyle V., to Anthony Company. Linear travel device for self-propelled articulated vehicle. 4,117,906, Cl. 180-139.000.
Muszumanski, Trude, to Vockenhuber, Karl; and Hauser, Raimund. Zoom objective, especially for a projector. 4,118,108, Cl. 350-184.000.
Myers, Allen D., to Caterpillar Tractor Co. Spring assembly and method of assembly thereof. 4,118,020, Cl. 267-168.000.
Myers, Edward B., to Honeywell Inc. Rotary valve. 4,118,008, Cl. 251-298.000.
Myers, Gary A.; Abdul-Rahman, Yahia A. K.; and Skinner, James L., to Atlantic Richfield Company. Separation and recovery of heat carriers in an oil shale retorting process. 4,118,309, Cl. 208-11.00R.
Myers, James E.; and Kennedy, Tom E., to Tyler Refrigeration Corporation. Roll-in open-front frozen food refrigeration case. 4,117,697, Cl. 62-256.000.
Myers, Robert A.; and Uhlig, Albert R., to Owens-Illinois, Inc. Two-stage process for industrial blow molding. 4,118,452, Cl. 264-89.000.
Myhand, James K.: *See*—
McPeak, Walter G.; and Myhand, James K., 4,117,557, Cl. 4-149.000.
Nagano, Toshihiro: *See*—
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,117,703, Cl. 72-38.000.
Nagase, Hidenobu: *See*—
Tanaka, Minoru; Kajitani, Ikuo; and Nagase, Hidenobu, 4,117,675, Cl. 60-302.000.
Nagashima, Nozomu: *See*—
Kurata, Junichi; Ishikawa, Kazushige; and Nagashima, Nozomu, 4,118,039, Cl. 274-9.0RA.
Nahas, Nicholas C.: *See*—
Eakman, James M.; Nahas, Nicholas C.; and Euker, Charles A., Jr., 4,118,204, Cl. 48-197.00R.
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Zjukin, Nikolai Stepanovich; Kostjuk, Boris Dmitrievich; Shaikevich, Stanislava Stanislavovna; Motsak, Yaroslav Feodosievich; Fedulaev, Vitaly Pavlovich; Kolchemanov, Nikolai Alexandrovich; Ugarov, Valentin Mikhailovich; Losev, Viktor Vasilievich; Drui, Mark Simonovich; Lavrinovich, Alla Alexandrovna; Shpotakovsky, Dmitry Fedorovich; and Chizhov, Stanislav Viktorovich. Method for soldering metals with superhard man-made materials. 4,117,968, Cl. 228-124.000.
Najmowicz, Zenon; Dyrda, Edward; and Zakrzewski, Jan, to Przedsiebiorstwo Projektowania i Wyosazania Zakladow Przemysly Maszyn i Apartow Elektrycznych "Promel". Unit for centrifugal casting of metals in split moulds. 4,117,878, Cl. 164-292.000.
Nakache, Robert; and Lequeux, Christian, to Societe Coil Protection Service. Method and apparatus for producing a bent angle piece from a sheet-metal. 4,117,704, Cl. 72-83.000.
Nakagawa, Junyo; Akagi, Takao; and Hiramatsu, Koji, to Kuraray Company, Limited. Suede woven fabric and a process of manufacturing the same. 4,118,529, Cl. 428-91.000.
Nakamura, Katsuhiko: *See*—
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,117,703, Cl. 72-38.000.
Nakamura, Minoru, to Idemitsu Lion Co., Ltd. Packing band tightening device. 4,117,573, Cl. 24-74.00A.
Nakamura, Ryuji; and Motogi, Hideo, to Shikoky Kaken Kogyo Kabushiki Kaisha. Method for producing inorganic porous shaped material. 4,118,450, Cl. 264-43.000.
Nakamura, Shigeru: *See*—
Ishiguro, Susumu; Komuro, Masuhiro; and Nakamura, Shigeru, 4,118,347, Cl. 521-53.000.
Nakao, Hideyuki; Kasai, Yasuhiro; Ikehata, Yukio; Masuda, Shigeyuki; Obara, Nobuo; and Nishida, Isamu, to Kabushiki Kaisha Daini Seikosha. Magnetic shield plate mounting structure for an electronic timepiece. 4,117,665, Cl. 58-106.500.

Nalesnik, Theodore E.: *See*—
Holy, Norman L.; and Nalesnik, Theodore E., 4,118,426, Cl. 260-615.00B.
Namboodri, Chettoor G.: *See*—
Gregorian, Razmic S.; and Namboodri, Chettoor G., 4,118,526, Cl. 427-350.000.
Nannini, Giuliano: *See*—
Giraldi, PierNicola; Nannini, Giuliano; Logemann, Willy; Tommasini, Raffaele; Buttinoni, Ada; and Biasoli, Giovanni, 4,118,504, Cl. 424-274.000.
Napoli, Louis Sebastian: *See*—
Risko, John Joseph; and Napoli, Louis Sebastian, 4,118,598, Cl. 325-26.000.
Nara, Toshihiko; Mitsui, Norihiko; and Shigeta, Masayuki, to Hitachi, Ltd. Elevator having rope guide means. 4,117,908, Cl. 187-20.000.
Naruse, Yohsuke: *See*—
Okada, Hitoshi; and Naruse, Yohsuke, 4,118,736, Cl. 358-128.000.
National Cablevision, Limited: *See*—
Fung, Paul J., 4,118,669, Cl. 325-309.000.
National Distillers and Chemical Corporation: *See*—
Rekers, Louis J., 4,118,340, Cl. 252-428.000.
National Research Development Corporation: *See*—
Fray, Derek John; and Cleland, James Henry, 4,118,292, Cl. 204-67.000.
National Semiconductor Corporation: *See*—
Monticelli, Dennis M.; and Sleeth, Robert S., 4,118,621, Cl. 250-214.00A.
Ochi, Sam S.; Hamade, Adib R.; and Culmer, Daniel D., 4,118,640, Cl. 307-237.000.
National Steel Corporation: *See*—
Gobert, Robert R., 4,118,302, Cl. 204-206.000.
Navlyt, Gerald S., to Union Special Corporation. Overedge stitch formation. 4,117,792, Cl. 112-433.000.
Naylor, Thomas Kipling, to American Optical Corporation. Cardiac instrumentation apparatus with pacer diagnostics. 4,117,848, Cl. 128-419.0PT.
NCR Corporation: *See*—
Wilson, Denney L., Sr., 4,118,768, Cl. 363-85.000.
Wilson, Denney Lee, Sr., 4,118,769, Cl. 363-54.000.
Neal, Brian; and Andersen, Lars Q., to Boeing Company, The. Noise suppressing exhaust mixer assembly for ducted-fan, turbojet engine. 4,117,671, Cl. 60-262.000.
Neasham, Leo B. Vehicle towing trailer. 4,118,047, Cl. 280-402.000.
Nebeling, Reinhard: *See*—
Molls, Hans-Heinz; Schiwy, Willy; Hornle, Reinhold; and Nebeling, Reinhard, 4,118,384, Cl. 260-163.000.
Nebon, Jean-Pierre; and Morel, Robert, to Merlin Gerin. High-speed current-limiting device having a contact reclosing retarding member. 4,118,681, Cl. 335-195.000.
Neeb, Karl-Heinz; and Richter, Heinrich, to Kraftwerk Union Aktiengesellschaft. Method of purifying ion exchanger resins spent in the operation of a nuclear reactor. 4,118,317, Cl. 210-32.000.
Nelson, Albin J., to Pfizer Inc. Pyrrolidonecarboxylic acid therapeutic agents. 4,118,503, Cl. 424-274.000.
Nelson, Gunner E., to Ethyl Corporation. Process for preparing alkanol amide compositions. 4,118,404, Cl. 260-404.000.
Nelson, Lloyd A.; and Sekhon, Kalwant S., to Hughes Aircraft Company. Heat pipe thermal mounting plate for cooling electronic circuit cards. 4,118,756, Cl. 361-385.000.
Nelson, Norman A., to Upjohn Company, The. 4,5,6-Trinor-3,7-inter-m-phenylene prostaglandin A_1 analogs. 4,118,577, Cl. 560-53.000.
Nelson, Vernon L. Easy clean eave trough. 4,117,635, Cl. 52-11.000.
Nestler, Heinz: *See*—
Amort, Jurgen; and Nestler, Heinz, 4,118,540, Cl. 428-447.000.
Neti, Radhakrishna Murty; and Sawa, Kenneth Bruno, to Beckman Instruments, Inc. Catalytic reactor systems method and apparatus. 4,118,193, Cl. 422-94.000.
Neukom, Chester G., to Haybuster Manufacturing, Inc. Ground drive for grain drills. 4,117,891, Cl. 172-105.000.
Neurath, Robert A.: *See*—
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, 4,118,478, Cl. 424-89.000.
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, 4,118,479, Cl. 424-89.000.
Neveux, Rene Elie, to Societe Anonyme Francaise du Ferodo. Safety belt device with a winder/unwinder especially for automobiles. 4,118,053, Cl. 280-747.000.
New York Blood Center, Inc., The: *See*—
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, 4,118,478, Cl. 424-89.000.
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, 4,118,479, Cl. 424-89.000.
Newman, Paul; and Sargent, Raymond Fredrick, to Rolls-Royce Limited. Fluid bearings with conforming shells. 4,118,079, Cl. 308-9.000.
Newman, Thomas A.; and Kettner, Erich O., to Philip Morris Incorporated. Method and apparatus for reclaiming tobacco from cigarettes. 4,117,852, Cl. 131-96.000.
Ngai, Mun-Hay. Record player. 4,118,037, Cl. 274-1.00A.
Nichols Engineering & Research Corp.: *See*—
von Dreusche, Charles F., Jr.; and Barry, Louis T., 4,118,220, Cl. 75-69.000.
Nickerson, James H. D.; and Steel, Robert R., to Foster Wheeler Limited. Slab header. 4,117,885, Cl. 165-176.000.
Niederer, Thomas O., to Otto Niederer Sons, Inc. Coiled spring conveyor for eggs. 4,117,922, Cl. 198-652.000.
Nielinger, Werner; Brassat, Bert; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Reinforced polyhexamethylene isophthalamide. 4,118,364, Cl. 260-37.00N.
Nies, Herbert: *See*—
Haberlein, Harald; Nies, Herbert; and Scheidl, Franz, 4,118,352, Cl. 260-23.0XA.
Nifco, Inc.: *See*—
Notoya, Yoshiaki, 4,117,998, Cl. 248-56.000.
Sugiyama, Masaaki; Yuda, Takuo; and Mizusawa, Akira, 4,118,323, Cl. 210-439.000.
Nihon Nohyaku Co., Ltd.: *See*—
Taninaka, Kuniaki; Kurono, Hitoshi; and Kasai, Tsutomu, 4,118,506, Cl. 424-277.000.
Niihara, Koichi: *See*—
Hirai, Toshio; and Niihara, Koichi, 4,118,539, Cl. 428-446.000.
Niki, Akio: *See*—
Ogawa, Toshiya; Niki, Akio; Uchimura, Kazuo; and Tsuruoka, Koichi, 4,118,695, Cl. 340-324.0AD.
Niki, Hiroshi; Deya, Eiki; Doi, Toru; Igarashi, Seiichiro; and Hayashi, Hiromichi, to Snow Brand Milk Products Co. Ltd. Method of preparing fish meat powder having kamaboko-forming property. 4,118,517, Cl. 426-271.000.
Nikkey Co., Ltd.: *See*—
Shimizu, Toyoaki, 4,117,567, Cl. 16-50.000.
Nikolaus, Harold W.: *See*—
Eckert, Lewis W.; Nikolaus, Harold W.; and Ollinger, James C., 4,117,642, Cl. 52-486.000.
Niles, Hollandra P.: *See*—
Gaffar, Abdul; and Niles, Hollandra P., 4,118,472, Cl. 424-54.000.
Gaffar, Abdul; and Niles, Hollandra P., 4,118,473, Cl. 424-54.000.
Gaffar, Abdul; and Niles, Hollandra P., 4,118,474, Cl. 424-54.000.
Gaffar, Abdul; and Niles, Hollandra P., 4,118,475, Cl. 424-54.000.
Gaffar, Abdul; and Niles, Hollandra P., 4,118,476, Cl. 424-54.000.
Nilsson, Goran Alfred; Edstrom, Kjell; and Wiklund, Henry. Vibration attenuating device. 4,117,764, Cl. 91-50.000.
Ninomiya, Mitsuaki: *See*—
Shishido, Toshimasa; and Ninomiya, Mitsuaki, 4,118,445, Cl. 261-44.00B.
Nippon Electric Company, Ltd.: *See*—
Isomura, Masayoshi, 4,118,776, Cl. 364-474.000.
Noguchi, Tsutomu, 4,118,672, Cl. 330-286.000.
Ohtsuki, Nobuo; Hayashi, Toshio; Imai, Akio; Takahashi, Yoshio; and Hashimoto, Noboru, 4,118,660, Cl. 318-571.000.
Nippon Kogaku K.K.: *See*—
Ishibashi, Kazufumi; Matsumaru, Shizuo; and Ichimura, Takeo, 4,118,238, Cl. 106-47.00Q.
Matsui, Sei, 4,118,722, Cl. 354-155.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Suzuki, Hideo; Sato, Takahisa; Kubota, Tatsuo; Osaka, Shigemi; and Komatsu, Shigeru, 4,118,402, Cl. 260-346.750.
Nippon Steel Corporation: *See*—
Ichijima, Isamu; Watanabe, Seiichi; and Miyagawa, Kazuo, 4,118,732, Cl. 358-101.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Izumi, Kazuto; and Izumi, Kazuo, 4,118,785, Cl. 364-754.000.
Nirk, Peter: *See*—
Koula, Zdenek; Nirk, Peter; and Wullschleger, Hans, 4,117,799, Cl. 118-6.000.
Nischk, Gunther: *See*—
Lindner, Christian; Suling, Carlhans; Arend, Gunter; Brokmeier, Dieter; and Nischk, Gunther, 4,118,375, Cl. 526-240.000.
Nishida, Isamu: *See*—
Nakao, Hideyuki; Kasai, Yasuhiro; Ikehata, Yukio; Masuda, Shigeyuki; Obara, Nobuo; and Nishida, Isamu, 4,117,665, Cl. 58-106.500.
Nishida, Tsuyeshi, to Kubota, Ltd. System for draining air from an engine fuel filter. 4,117,817, Cl. 123-136.000.
Nishikawa, Tokio: *See*—
Morishita, Masataka; Yokokawa, Yasuo; Nishikawa, Tokio; Mishiro, [illegible]ahiro; Ohashi, Shigeyasu; Fukushima, Mitsuru; Inaba, Yoshihito; and Matsuda, Tetsuo, 4,118,336, Cl. 252-316.000.
Nishimaki, Kazuo: *See*—
Watanabe, Takeshi; Nishimaki, Kazuo; Shimanuki, Kazuo; Mita, Katuo; and Konno, Satoru, 4,118,210, Cl. 65-2.000.
Nissan Motor Company, Limited: *See*—
Gotoh, Miyuki, 4,117,870, Cl. 139-370.200.
Ikeura, Kenji, 4,117,815, Cl. 123-119.0EC.
Kawai, Michio, 4,117,821, Cl. 123-179.00L.
Nissei Plastics Industrial Co., Ltd.: *See*—
Shima, Yoshiharu, 4,118,051, Cl. 280-610.000.
Nittetu Chemical Engineering Ltd.: *See*—
Sano, Masaru; and Kashima, Koji, 4,118,467, Cl. 423-573.00R.
Nitto Boseki Co., Ltd.: *See*—
Watanabe, Takeshi; Nishimaki, Kazuo; Shimanuki, Kazuo; Mita, Katuo; and Konno, Satoru, 4,118,210, Cl. 65-2.000.
Niwa, Masatake: *See*—
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, 4,118,724, Cl. 354-266.000.
Noble, Peter M., to Westinghouse Air Brake Company. Method of locating a light at the focal point of a concave mirror of a signal lamp unit. 4,118,126, Cl. 356-123.000.
Noguchi, Matsusaburo: *See*—
Watanabe, Akinori; Tanoshima, Katsuhide; Noguchi, Matsusaburo; and Hattori, Kinya, 4,117,778, Cl. 101-1.000.
Noguchi, Tsutomu, to Nippon Electric Company, Ltd. Attenuation equalizer having constant resistance. 4,118,672, Cl. 330-286.000.
Noir, Dominique; and Meier, John, to Battelle Development Corpora-

tion. Method and apparatus for controlling burner stoichiometry. 4,118,172, Cl. 431-12.000.
Noramco, Inc.: *See*—
Kumhyr, Elmer B., 4,118,603, Cl. 179-16.00E.
Norback, Per G., to Aktiebolaget Carl Munters. Catalytic purifier unit. 4,118,198, Cl. 422-173.000.
Norgard, Fred C.: *See*—
Godin, Gilbert; and Norgard, Fred C., 4,118,273, Cl. 162-171.000.
Norlin Music, Inc.: *See*—
Swain, Richard Slaughter, 4,118,791, Cl. 364-900.000.
Norster, Eric Roy: *See*—
Flanagan, Paul; Norster, Eric Roy; Carrubba, Robert V.; and Heck, Ronald M., 4,118,171, Cl. 431-10.000.
North American Philips Corporation: *See*—
Francis, Gaylord Lee; and Morelli, Amedeo John, 4,117,589, Cl. 29-619.000.
Norton, James F.; and Silagy, Richard J., to Hansen Manufacturing Company, The. Socket assembly. 4,118,006, Cl. 251-149.600.
Notoya, Yoshiaki, to Nifco, Inc. Retaining device for cords. 4,117,998, Cl. 248-56.000.
Novikoff, Eugene B., to Knogo Corporation. Method and apparatus for producing uniform electromagnetic fields in an article detection system. 4,118,693, Cl. 340-572.000.
Nussbaumer, Henri J., to International Business Machines Corporation. Differential DFT digital filtering device. 4,118,784, Cl. 364-724.000.
Obara, Nobuo: *See*—
Nakao, Hideyuki; Kasai, Yasuhiro; Ikehata, Yukio; Masuda, Shigeyuki; Obara, Nobuo; and Nishida, Isamu, 4,117,665, Cl. 58-106.500.
Obeissart, Albert, to Souriau & Cie. Electrical connectors. 4,118,093, Cl. 339-75.00M.
Oberg, Karl Erik. Method and a system for producing and laying oil or gas pipelines on the sea bottom. 4,117,692, Cl. 405-166.000.
Oberreuter, Theodor; Schimmer, Rigobert; and Seifert, Wilhelm, to LICENTIA Patent-Verwaltungs-GmbH. Method for producing a semiconductor device having monolithically integrated units in a semiconductor body. 4,118,257, Cl. 148-187.000.
O'Brien, John P. Golfer's stance block. 4,118,034, Cl. 273-32.00C.
Occidental Oil Shale, Inc.: *See*—
French, Gordon B.; and Ridley, Richard D., 4,118,070, Cl. 299-2.000.
Hutchins, Ned M., 4,118,071, Cl. 299-2.000.
Ochi, Sam S.; Hamade, Adib R.; and Culmer, Daniel D., to National Semiconductor Corporation. JFET base junction transistor clamp. 4,118,640, Cl. 307-237.000.
Oestreicher, Stephen L.; and Hardin, David P., to Farmland Industries, Incorporated. Herbicidally active substituted pyrimidine compounds and method of using same. 4,118,217, Cl. 71-92.000.
O'Farrell, Charles P.: *See*—
Makowski, Henry S.; and O'Farrell, Charles P., 4,118,353, Cl. 260-28.50B.
Makowski, Henry S.; and O'Farrell, Charles P., 4,118,360, Cl. 260-31.20R.
Ogawa, Toshiya; Niki, Akio; Uchimura, Kazuo; and Tsuruoka, Koichi, to Ricoh Company, Ltd. Data processing system. 4,118,695, Cl. 340-324.0AD.
Ohashi, Shigeyasu: *See*—
Morishita, Masataka; Yokokawa, Yasuo; Nishikawa, Tokio; Mishiro, Masahiro; Ohashi, Shigeyasu; Fukushima, Mitsuru; Inaba, Yoshihito; and Matsuda, Tetsuo, 4,118,336, Cl. 252-316.000.
Ohloff, Gunther: *See*—
Skorianetz, Werner; and Ohloff, Gunther, 4,118,343, Cl. 252-522.000.
Ohno, Nobuo: *See*—
Kitamura, Shigeyoshi; Itaya, Nobushige; Okuno, Yoshitoshi; Ohno, Nobuo; Matsuo, Takashi; Hirano, Masachika; Mizutani, Toshio; and Takeda, Hisami, 4,118,505, Cl. 424-275.000.
Ohori, Tamio: *See*—
Tomita, Satoru; Ohori, Tamio; Karasawa, Shuichi; and Ohta, Wasaburo, 4,118,710, Cl. 346-153.000.
Ohta, Takahiro; and Muramatsu, Akira, to Fuji Photo Film Co., Ltd. Automatic light intensity control for x-ray film viewer. 4,118,654, Cl. 40-361.000.
Ohta, Wasaburo: *See*—
Tomita, Satoru; Ohori, Tamio; Karasawa, Shuichi; and Ohta, Wasaburo, 4,118,710, Cl. 346-153.000.
Ohtani, Kazumasa: *See*—
Fukuda, Yoshiharu; Ohtani, Kazumasa; Onissi, Tossio R.; and Takeuchi, Akitoshi, 4,118,196, Cl. 422-232.000.
Ohtsuki, Nobuo; Hayashi, Toshio; Imai, Akio; Takahashi, Yoshio; and Hashimoto, Noboru, to Nippon Electric Company Ltd. Automatic machining system. 4,118,660, Cl. 318-571.000.
Oishi, Masaaki: *See*—
Suzuki, Tetsuro; Oishi, Masaaki; and Ashida, Itaru, 4,117,743, Cl. 74-577.00M.
Okada, Hitoshi; and Naruse, Yohsuke, to Sony Corporation. Method of and apparatus for controlling the optical reading of recorded information. 4,118,736, Cl. 358-128.000.
Okada, Takeshi, to Olympus Optical Co., Ltd. Film cassette for an endoscope. 4,117,987, Cl. 242-71.200.
Okajima, Hidekazu; and Iwama, Hideto, to Canon Kabushiki Kaisha. Light metering system for a photographic camera. 4,118,714, Cl. 354-31.000.
Oki Electric Industry Co., Ltd.: *See*—
Watanabe, Akinori; Tanoshima, Katsuhide; Noguchi, Matsusaburo; and Hattori, Kinya, 4,117,778, Cl. 101-1.000.
Oku, Kyoichi; and Matsuura, Hiroshi, to Jujo Paper Co., Ltd. Method for the preparation of a pulp. 4,118,271, Cl. 162-31.000.
Okuno, Yoshitoshi: *See*—
Kitamura, Shigeyoshi; Itaya, Nobushige; Okuno, Yoshitoshi; Ohno, Nobuo; Matsuo, Takashi; Hirano, Masachika; Mizutani, Toshio; and Takeda, Hisami, 4,118,505, Cl. 424-275.000.
Olcott, Richard J.; and Cross, Ronald H. Washing machine for industrial parts. 4,117,855, Cl. 134-141.000.
Olin Corporation: *See*—
Brennan, James P., 4,118,570, Cl. 544-190.000.
Goldstein, Stephen L.; and Babiec, John S., Jr., 4,118,586, Cl. 568-767.000.
Johnson, James H.; Fowler, Arnold L.; Brooks, Julius E.; and Friend, Harvey H., 4,117,761, Cl. 89-129.00B.
Saeman, Walter C., 4,118,524, Cl. 427-213.000.
Specht, Steven J., 4,118,308, Cl. 204-296.000.
Waxelbaum, Paul M.; Harris, Fred A.; and Brown, William J., 4,117,984, Cl. 241-73.000.
Ollinger, James C.: *See*—
Eckert, Lewis W.; Nikolaus, Harold W.; and Ollinger, James C., 4,117,642, Cl. 52-486.000.
Oloman, Colin William; and Watkinson, Alan Paul, to Canadian Patents and Development Limited. Apparatus for electrochemical reactions. 4,118,305, Cl. 204-265.000.
Olschewski, Armin: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,118,078, Cl. 308-6.00C.
Olsen, James A.; Butler, Gene R.; and Sesser, George L., to Sperry Rand Corporation. Means for adjusting the sideboard. 4,117,942, Cl. 214-6.00B.
Olstad, Paul Henrik: *See*—
Kjohl, Olav; and Olstad, Paul Henrik, 4,118,242, Cl. 106-98.000.
Olympus Optical Co., Ltd.: *See*—
Hanaoka, Naohiro; and Shimoda, Misao, 4,118,747, Cl. 360-121.000.
Hashimoto, Akihiko, 4,118,721, Cl. 354-147.000.
Okada, Takeshi, 4,117,987, Cl. 242-71.200.
Sato, Masaaki, 4,118,744, Cl. 360-74.000.
O'Neil, Charles P.; Smorzaniuk, Adam; and Young, James O., to Amerace Corporation. Timing device for fluid valve. 4,118,005, Cl. 251-75.000.
O'Neil, James R. Rope spinning toy. 4,117,625, Cl. 46-51.000.
Onissi, Tossio R.: *See*—
Fukuda, Yoshiharu; Ohtani, Kazumasa; Onissi, Tossio R.; and Takeuchi, Akitoshi, 4,118,196, Cl. 422-232.000.
Ono, Nobuyuki: *See*—
Ishino, Ken; Yamashita, Hiroshi; Ono, Nobuyuki; and Hashimoto, Yasuo, 4,118,704, Cl. 343-18.00A.
Onoda Cement Company, Limited: *See*—
Fukuda, Yoshiharu; Ohtani, Kazumasa; Onissi, Tossio R.; and Takeuchi, Akitoshi, 4,118,196, Cl. 422-232.000.
Itoh, Tsutomu, 4,117,971, Cl. 229-1.50B.
Onodera, Hirosuke. Baking apparatus. 4,118,181, Cl. 432-121.000.
Oosthoek, Raoul Henricus Josephus: *See*—
Visser, Johannes; Oosthoek, Raoul Henricus Josephus; Groeneweg, Jan Willem; and Dijkstra, Hendrik, 4,118,520, Cl. 426-574.000.
Opitz, Konrad; Landler, Josef; and Worfel, Erhard, to Hoechst Aktiengesellschaft. Stable liquid aqueous composition of a water-soluble fiber-reactive azo dyestuff, containing a buffer substance, the dyestuff having been prepared by diazotization with a nitrite and coupling in the absence of acid. 4,118,184, Cl. 8-26.000.
Optel Corporation: *See*—
Witzke, Horst; Chen, Schoen-nan; Deb, Satyendra K.; and Russak, Michael A., 4,118,546, Cl. 429-111.000.
Witzke, Horst; Chen, Schoen-nan; Deb, Satyendra K.; Jost, Steven Robert; Reichman, Joseph; and Russak, Michael A., 4,118,547, Cl. 429-111.000.
Optical Activity Ltd.: *See*—
Gundermann, Rolf Karl, 4,118,125, Cl. 356-116.000.
Optilon W. Erich Heilmann GmbH: *See*—
Heimberger, Helmut, 4,117,575, Cl. 24-205.13D.
Opuszenski, Theodore: *See*—
Rovin, Herman; Levine, Lawrence J.; Opuszenski, Theodore; Pellicano, Joseph; and Swenson, Alan F., 4,117,789, Cl. 112-181.000.
Organisation Europeenne de Recherches Spatiales: *See*—
David, Karl-Heinz, 4,118,622, Cl. 250-216.000.
Orvik, Jon A., to Dow Chemical Company, The. Preparation of urethane elastomers from epoxy resin, polyols and polyisocyanates using a catalyst composition of an organometal salt with either nitrogen or phosphorus compounds. 4,118,373, Cl. 528-73.000.
Osada, Hisashi: *See*—
Goshima, Yoshio; and Osada, Hisashi, 4,118,678, Cl. 333-70.00S.
Osaka, Shigemi: *See*—
Suzuki, Hideo; Sato, Takahisa; Kubota, Tatsuo; Osaka, Shigemi; and Komatsu, Shigeru, 4,118,402, Cl. 260-346.750.
Osaki, Toshio. Rotary piston compressor. 4,118,158, Cl. 418-54.000.
Osawa, Keiichi: *See*—
Sato, Naohiko; and Osawa, Keiichi, 4,117,812, Cl. 123-117.00A.
Osburn, James Patrick; and Robinson, John William, to Kimball International, Inc. Binary word debouncer. 4,117,758, Cl. 84-1.010.
Osipow, Lloyd I.: *See*—
Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C., 4,117,958, Cl. 222-402.180.
Osteen, Mitchell M., to General Electric Company. Variable transmission prismatic refractors. 4,118,763, Cl. 362-339.000.

O'Steen, Wilbourne D.: *See*—
Friddle, William D., Sr.; Friddle, William D., Jr.; and O'Steen, Wilbourne D., 4,117,753, Cl. 83-143.000.
Otis Engineering Corporation: *See*—
Fredd, John V., 4,117,563, Cl. 10-101.00R.
Otto Niederer Sons, Inc.: *See*—
Niederer, Thomas O., 4,117,922, Cl. 198-652.000.
Oury, Robert F., to Rotec Industries. Auger hopper. 4,117,920, Cl. 198-311.000.
Outboard Marine Corporation: *See*—
Martin, Herman H., Jr., 4,117,651, Cl. 56-10.500.
Overhausen, Hans-Walter: *See*—
Hadamovsky, Eugen; Hoppe, Wolfgang; Overhausen, Hans-Walter; Piotrowski, Bernhard; Schmid, Wehrhart; Schreiber, Georg; and Schroeder, Heinz, 4,118,313, Cl. 560-78.000.
Owens-Illinois, Inc.: *See*—
Lee, Soo-Il, 4,118,163, Cl. 425-146.000.
Mumford, George V., 4,117,945, Cl. 215-216.000.
Myers, Robert A.; and Uhlig, Albert R., 4,118,452, Cl. 264-89.000.
P.R. Mallory & Co. Inc.: *See*—
Liang, Charles Chi; and Joshi, AshokVenimadhav, 4,118,549, Cl. 429-191.000.
Przybyla, Franciszek J.; and Smith, Michael J., 4,118,544, Cl. 429-27.000.
PACCAR Of Canada, Ltd.: *See*—
Christison, Sommerville Grant; Magnuson, John Edwin; and Tham, Wing Chong, 4,118,013, Cl. 254-187.500.
Packaging Corporation of America: *See*—
VanderMey, Donald M., 4,117,929, Cl. 206-326.000.
Paduch, Stanley R.; and Smith, Lawrence S., to United Technologies Corporation. Power servo control. 4,117,765, Cl. 91-361.000.
Paetz, Eike: *See*—
Hodzic, Alija; Haferkamp, Dirk; Stach, Heinrich; and Paetz, Eike, 4,118,276, Cl. 176-60.000.
Paget, Charles J.; and Wikel, James H., to Eli Lilly and Company. Substituted 1-sulfonylbenzimidazoles. 4,118,573, Cl. 548-306.000.
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., to Eli Lilly and Company. Carbonyl-substituted 1-sulfonylbenzimidazoles. 4,118,742, Cl. 548-306.000.
Pahl, Karl-Heinz, to Pahl'sche Gummi-und Asbest-Gesellschaft PAGUAG. High pressure hose composed of elastomers and embedded reinforcements. 4,117,867, Cl. 138-119.000.
Pahl'sche Gummi-und Asbest-Gesellschaft PAGUAG: *See*—
Pahl, Karl-Heinz, 4,117,867, Cl. 138-119.000.
Pakhoed-Rotterdam B.V.: *See*—
Exler, Petrus Andre Theodorus; and Lobbe, Johannes, 4,118,209, Cl. 62-176.00D.
Pako Corporation: *See*—
Burg, John S.; Davidson, Donald M.; McClure, Marvin K.; and Sannel, Benjamin H., 4,117,604, Cl. 34-70.000.
Pakosh, Daniel, to Versatile Manufacturing Ltd. Rotary combine. 4,117,849, Cl. 130-27.00Q.
Palm, Lorenz A.; and Webb, David B., to Irvin Industries Canada Ltd. Parachute canopy. 4,117,993, Cl. 244-145.000.
Palumbo, Julius T., to Planchard, Arthur J., a part interest. Protective hard hat and welder's hood. 4,117,554, Cl. 2-418.000.
Pan, Jing Jong; Arnold, Milton Phillip; and Barton, James Castle, to Harris Corporation. Micro lens formation at optical fiber ends. 4,118,270, Cl. 156-659.000.
Panavision, Incorporated: *See*—
Gottschalk, Robert E., 4,118,720, Cl. 354-81.000.
Panke, Hans Ludwig: *See*—
Steckelberg, Willi; Panke, Hans Ludwig; May, Adolf; and Bucking, Hans-Walter, 4,118,324, Cl. 252-8.900.
Pantone, Richard S.: *See*—
Reiff, Helmut F.; and Pantone, Richard S., 4,118,411, Cl. 260-453.0SP.
Paraskos, John Angelo: *See*—
Frayer, James Albert; Lese, Henri K.; McKinney, Joel Drexler; Metzer, Kirk J.; and Paraskos, John Angelo, 4,118,310, Cl. 208-210.000.
Parekh, Girish Girdhar, to American Cyanamid Company. Cross linkable powder coating compositions. 4,118,437, Cl. 260-834.000.
Parekh, Hersh B.: *See*—
McWaters, Lynn D.; and Parekh, Hersh B., 4,118,687, Cl. 340-146.3ED.
Parker, John F.: *See*—
Bassett, Henry C.; From, Charles A., Jr.; Parker, John F.; and Worley, Ansel A., 4,118,596, Cl. 174-87.000.
Parks-Cramer (Great Britain) Ltd.: *See*—
Rushman, Reginald, 4,117,869, Cl. 139-1.00R.
Parrent, George B., Jr.; and Ward, John H., to Technical Operations, Incorporated. Optical detection of geometric configurations. 4,118,107, Cl. 350-162.0SF.
Pasternak, John Paul: *See*—
Berglund, Richard Newman; and Pasternak, John Paul, 4,118,095, Cl. 339-99.00R.
Pasynkov, Rafail Moiseevich: *See*—
Koshelenko, Gennady Petrovich; Pasynkov, Rafail Moiseevich; Sin, Mikhail Alexandrovich; and Shemper, Leonid Isaakovich, 4,117,770, Cl. 92-57.000.
Patchornik, Abraham: *See*—
Haviv, Fortuna; and Patchornik, Abraham, 4,118,562, Cl. 544-26.000.
Patel, Mahesh S., to Eutectic Corporation. Metaliferous flame spray material for producing machinable coatings. 4,118,527, Cl. 427-423.000.
Paton, W. Donald: *See*—
Steenson, Thomas William; and Paton, W. Donald, 4,117,639, Cl. 52-223.00R.
Patterson, Robert J.: *See*—
Koontz, Paul G.; Wright, Richard L.; and Patterson, Robert J., 4,118,116, Cl. 355-3.00R.
Paul-Heinz Wagner Maschinenfabrikation: *See*—
Wagner, Paul-Heinz; Hirtsiefer, Richard; and Muller, Johann, 4,117,735, Cl. 74-47.000.
Paul Troester Maschinenfabrik: *See*—
Baumgarten, Wilfried, 4,118,162, Cl. 425-113.000.
Pavan, Jean-Paul. Machine for performing cultivation under plastics. 4,117,787, Cl. 111-2.000.
Pavel, Klaus, to Rhein-Nadel Maschinennadel GmbH. Packing receptacle for sewing machine needles. 4,117,930, Cl. 206-382.000.
Paynton, William C. Electrical hazard indicator. 4,118,690, Cl. 340-656.000.
Pearce, Woodrow W. Plant watering device. 4,117,632, Cl. 47-81.000.
Pedain, Josef; Wellner, Wolfgang; Gruber, Hermann; and Dietrich, Manfred, to Bayer Aktiengesellschaft. Hydrocurable oxazolidine isocyanate prepolymer compositions. 4,118,376, Cl. 528-59.000.
Pedler, Keith. Method for reinforcing sheet material. 4,118,261, Cl. 156-145.000.
Peil, William, to General Electric Company. Smoke detector. 4,118,689, Cl. 340-629.000.
Pellegri, Alberto, to Diamond Shamrock Technologies S. A. Novel cathode and bipolar electrode incorporating the same. 4,118,294, Cl. 204-129.000.
Pelletier, Rene Charles, to Secemia. Metering device for bulk materials, more particularly constituents of animal foodstuffs. 4,117,954, Cl. 222-134.000.
Pellicano, Joseph: *See*—
Rovin, Herman; Levine, Lawrence J.; Opuszenski, Theodore; Pellicano, Joseph; and Swenson, Alan F., 4,117,789, Cl. 112-181.000.
Pennwalt Corporation: *See*—
Popoff, Ivan Christoff; Mailey, Everett A.; and Haines, Paul Gordon, 4,118,378, Cl. 526-36.000.
Pensak, Philip, to Colgate-Palmolive Company. Stable dentifrice. 4,118,471, Cl. 424-52.000.
Penton, Hugh V., to California Metal Enameling Company. Reflectorized symbol sign and method of fabricating and assembling. 4,117,616, Cl. 40-550.000.
Peppel, Howard C., deceased: *See*—
Davies, Norman; Langley, Morley P.; and Peppel, Howard C., deceased, 4,118,755, Cl. 361-379.000.
Peppel, Virginia L., administrator: *See*—
Davies, Norman; Langley, Morley P.; and Peppel, Howard C., deceased, 4,118,755, Cl. 361-379.000.
Perron, Yvon G.: *See*—
Lim, Gary M. F.; and Perron, Yvon G., 4,118,563, Cl. 544-26.000.
Perrotta, Anthony; and Rollo, Charles. Medicated bandage pocket. 4,117,841, Cl. 128-155.000.
Perryman, E. Firth, to R.T. French Company, The. Method of producing concentrated sauce product. 4,118,518, Cl. 426-516.000.
Pestolite, Inc.: *See*—
Phillips, Dennis G., 4,117,624, Cl. 43-113.000.
Peterson, David C., to Upjohn Company, The; and Upjohn Company, The. 3,7-Inter-m-phenylene-4,5,6-trinor-PGD_1 compounds. 4,118,591, Cl. 560-53.000.
Pethick, Raymond John: *See*—
Fleming, Francis William; and Pethick, Raymond John, 4,118,646, Cl. 310-58.000.
Petrolite Corporation: *See*—
Victor, Joe M.; and Dougherty, James, 4,118,300, Cl. 204-195.00T.
Petros, Andrew J., to Mesta Machine Company. Method and apparatus for coil handling at mill entry. 4,117,989, Cl. 242-78.800.
Petrov, Georgi Mitev; Andonov, Blagoy Alexandrov; Trayanov, Svetozar Paissiev; and Georgiev, Georgi Dimitrov, to Institute Po Obleklo I Textil. Method of and apparatus for the control of composite effect yarns. 4,117,654, Cl. 57-19.000.
Pfahnl, Arnold; and Schuller, Joris Maarten, to Bell Telephone Laboratories, Incorporated. Crossovers and method of fabrication. 4,118,595, Cl. 174-68.500.
Pfizer Inc.: *See*—
Johnson, Michael Ross; and Melvin, Lawrence Sherman, Jr., 4,118,559, Cl. 542-432.000.
Nelson, Albin J., 4,118,503, Cl. 424-274.000.
Philip Morris Incorporated: *See*—
Newman, Thomas A.; and Kettner, Erich O., 4,117,852, Cl. 131-96.000.
Philippson, Rainer; Krieger, Bernhard; Casals-Stenzel, Jorge; Kerb, Ulrich; Losert, Wolfgang; Prezewowsky, Klaus; Wiechert, Rudolf; and Bittler, Dieter, to Schering Aktiengesellschaft. 4-Androsten-3-ones and process for the preparation thereof. 4,118,488, Cl. 424-238.000.
Phillips, David C.; Hickam, William M.; and Carlson, Gerald L., to Westinghouse Electric Corp. Particulography as an on-line technique for detection and location of faults within a gas-cooled dynamoelectric machine caused by overheating. 4,117,713, Cl. 73-17.00R.
Phillips, Dennis G., to Pestolite, Inc. Insect trap. 4,117,624, Cl. 43-113.000.
Phillips, Michael, to L.A. Dreyfus Company. Method for handling and transporting thermoplastic materials. 4,117,645, Cl. 53-431.000.

Phillips Petroleum Company: *See*—
Fahey, Darryl R.; and Mahan, John E., 4,118,408, Cl. 260-439.00R.
Hendrix, Hurshel V., 4,117,684, Cl. 405-54.000.
Murtha, Timothy P.; and Zuech, Ernest A., 4,118,434, Cl. 260-668.00R.
Smith, Kenneth E., 4,117,655, Cl. 57-58.830.

Pickens, Billie J. Device for opening or closing a zipper. 4,117,961, Cl. 223-111.000.

Pierrat, Michel A., to Compudrive Corporation. Orbital drive mechanism. 4,117,746, Cl. 74-805.000.

Pifferi, Giorgio; and Pinza, Mario, to I.S.F. S.p.A. Pyrrolidine derivatives. 4,118,396, Cl. 260-326.430.

Pignocco, Arthur J.; and Kachik, Robert H., to United States Steel Corporation. Refractory lined cylindrical article. 4,117,868, Cl. 138-146.000.

Piligrino, Dimi. Knife. 4,117,593, Cl. 30-314.000.

Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, to Ciba-Geigy AG. Photographic material containing sulphonic acid group containing disazo dyestuffs. 4,118,232, Cl. 96-99.000.

Pinza, Mario: *See*—
Pifferi, Giorgio; and Pinza, Mario, 4,118,396, Cl. 260-326.430.

Pioneer Electronic Corporation: *See*—
Kurata, Junichi; Ishikawa, Kazushige; and Nagashima, Nozomu, 4,118,039, Cl. 274-9.0RA.

Piotrowski, Bernhard: *See*—
Hadamovsky, Eugen; Hoppe, Wolfgang; Overhausen, Hans-Walter; Piotrowski, Bernhard; Schmid, Wehrhart; Schreiber, Georg; and Schroeder, Heinz, 4,118,313, Cl. 560-78.000.

Piretti, Giancarlo, to Societa Anonima Castelli s.a.s. Di C. Castelli & C. Disassemblable table. 4,117,784, Cl. 108-150.000.

Pitney-Bowes, Inc.: *See*—
Calvi, Salvatore J.; and Stelben, John J., 4,118,178, Cl. 432-35.000.
Carvalko, Joseph R.; and Tolmie, Robert J., Jr., 4,118,634, Cl. 250-577.000.

Pitzalis, Mario: *See*—
Vargiu, Silvio; Carpaneti, Edoardo; Crespolini, Giancarlo; and Pitzalis, Mario, 4,118,555, Cl. 526-76.000.

Planchard, Arthur J.: *See*—
Palumbo, Julius T., 4,117,554, Cl. 2-418.000.

Plantard, Dominique: *See*—
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,118,213, Cl. 65-5.000.

Platz, Rolf: *See*—
Fouquet, Gerd; Merger, Franz; Platz, Rolf; and Baer, Karl, 4,118,588, Cl. 560-210.000.

Plempel, Manfred: *See*—
Regel, Erik; Draber, Wilfried; Buchel, Karl Heinz; and Plempel, Manfred, 4,118,487, Cl. 424-232.000.

Plessey Handel und Investments A.G.: *See*—
Boyce, Peter Howard, 4,118,775, Cl. 364-467.000.

Pletscher, Gebruder: *See*—
Pletscher, Oskar, 4,117,962, Cl. 224-31.000.

Pletscher, Oskar, to Pletscher, Gebruder. Bicycle luggage carrier equipped with recognition and safety device. 4,117,962, Cl. 224-31.000.

Pluzhnov, Stanislav Konstantinovich: *See*—
Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,118,432, Cl. 260-683.15D.

Pogorely, Nikolai Pavlovich: *See*—
Burin, Viktor Leontievich; Tjutjunnikov, Anatoly Borisovich; Golosov, Viktor Nikolaevich; Tarynin, Evgeny Konstantinovich; Pogorely, Nikolai Pavlovich; and Lukyanenko, Vladimir Matveevich, 4,118,446, Cl. 261-114.0VT.

Pohl, Ludwig: *See*—
Krause, Joachim; Streinstrasser, Ralf; Pohl, Ludwig; Del Pino, Fernando; and Weber, Georg, 4,118,335, Cl. 252-299.000.

Polaroid Corporation: *See*—
Chambers, Melvin T.; and Hardy, Herbert L., 4,118,737, Cl. 352-130.000.

Polymer Corporation, The: *See*—
Hanley, Michael A.; Miller, Lawrence A.; and Kinsey, Irvin H., 4,118,345, Cl. 260-2.300.

Polysius AG: *See*—
Mollenkopf, Hans; Ritzmann, Horst; Wurr, Jurgen; Schmits, Heinz-Berbert; Heinemann, Otto; Krutzner, Karl, jun.; and Schossler, Werner, 4,118,176, Cl. 432-14.000.
Weber, Paul; Lankes, Erich; Butschko, Gerhard; Ritzmann, Horst; and Bohm, Peter Wolfgang, 4,118,177, Cl. 432-14.000.

Pomella, Piero; and Lauro, Luciano, to Ing. C. Olivetti & C., S.p.A. Numerical control system for machine tools. 4,118,771, Cl. 364-101.000.

Pope, Ivan: *See*—
Moore, Ray G.; and Coffman, William M., Jr., 4,117,804, Cl. 119-1.000.

Popoff, Ivan Christoff; Mailey, Everett A.; and Haines, Paul Gordon, to Pennwalt Corporation. Non-blooming accelerator and process for vulcanization of EPDM elastomers. 4,118,378, Cl. 526-36.000.

Porta, Gary Douglas: *See*—
Leidy, James Albert; and Porta, Gary Douglas, 4,118,103, Cl. 339-98.000.

Porter, Gary D.; and Bogdanoff, Anatoly, to United States of America, Energy. Guidance system for laser targets. 4,118,627, Cl. 250-397.000.

Post Office: *See*—
Cockett, Stewart Graham; Taylor, Jeffrey Philip; Craven, Peter; and Farmer, Alan Charles, 4,118,790, Cl. 364-900.000.

Poth, Robert. Collapsible tub insert. 4,117,558, Cl. 4-173.00R.

Potlatch Corporation: *See*—
Sellors, Thomas J., 4,117,972, Cl. 229-28.00R.

Potts, David E.: *See*—
Hamill, Herbert R.; and Potts, David E., 4,118,245, Cl. 106-288.00B.
Horzepa, John P.; and Potts, David E., 4,118,246, Cl. 106-288.00B.

Pouliot, Harvey N.: *See*—
Kemper, Yves Jean; and Pouliot, Harvey N., 4,117,736, Cl. 74-60.000.

Powell, William E.: *See*—
Brezinski, Donald P.; and Powell, William E., 4,118,781, Cl. 364-525.000.

Power, George Edward; and Bolling, Donald Louis, to Formica Corporation. Release sheet of a coated cellulose paper. 4,118,541, Cl. 428-452.000.

PQ Corporation: *See*—
Lazet, Frank J.; Meador, D. John; and Webster, Richard G., 4,118,463, Cl. 423-334.000.

Prather, Jimmy F. Method of feeding cotton to a gin. 4,117,571, Cl. 19-64.500.

Precision Monolithics, Inc.: *See*—
Comer, Donald T., 4,118,699, Cl. 340-347.0DA.

Preece, Kenneth; and Cheary, Walter Graham, to Lucas Industries Limited. Pole claw member for a dynamo electric machine rotor. 4,117,793, Cl. 113-116.00D.

Premier Cablevision, Limited: *See*—
Fung, Paul J., 4,118,669, Cl. 325-309.000.

Preway Inc.: *See*—
Billmeyer, Thomas F., 4,117,827, Cl. 126-121.000.

Prezewowsky, Klaus: *See*—
Philippson, Rainer; Krieger, Bernhard; Casals-Stenzel, Jorge; Kerb, Ulrich; Losert, Wolfgang; Prezewowsky, Klaus; Wiechert, Rudolf; and Bittler, Dieter, 4,118,488, Cl. 424-238.000.

Price, Edwin. Surface and edge laminating apparatus. 4,118,268, Cl. 156-510.000.

Prima International: *See*—
Dawson, Robert L., 4,117,936, Cl. 211-50.000.

Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, to New York Blood Center, Inc., The. Vaccine manufacture for active immunization containing hepatitis B surface antigen and associated antigen. 4,118,478, Cl. 424-89.000.

Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, to New York Blood Center, Inc., The. Vaccine for active immunization containing hepatitis B surface antigen and associated antigen. 4,118,479, Cl. 424-89.000.

Procter & Gamble Company, The: *See*—
Jones, Kenneth L., 4,118,525, Cl. 427-242.000.

Proctor & Associates Company: *See*—
Proctor, Darryl F.; Skelly, Peter T.; and Cole, Darrell D., 4,118,597, Cl. 179-18.0FA.

Proctor, Darryl F.; Skelly, Peter T.; and Cole, Darrell D., to Proctor & Associates Company. Method and apparatus for detecting direct currents in a transmission line. 4,118,597, Cl. 179-18.0FA.

Progressive Machine Products, Inc.: *See*—
Betush, Frank A., 4,117,861, Cl. 137-595.000.

Pryor, Peter Paul, Jr.: *See*—
United States of America, National Aeronautics and Space Administration; Wall, William A., Jr.; Ives, Robert E.; Bruce, Miles Melvin, Jr.; Pryor, Peter Paul, Jr.; and Gard, Leslie H., 4,118,620, Cl. 219-124.320.

Przedsiebiorstwo Projektowania i Wyosazania Zakladow Przemysly Maszyn i Apartow Elektrycznych "Promel": *See*—
Najmowicz, Zenon; Dyrda, Edward; and Zakrzewski, Jan, 4,117,878, Cl. 164-292.000.

Przybyla, Franciszek J.; and Smith, Michael J., to P.R. Mallory & Co. Inc. Metal-air depolarized cell having restricted gas passageway. 4,118,544, Cl. 429-27.000.

Pugsley, Thomas A.: *See*—
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,118,511, Cl. 424-330.000.

Pundt, Richard A. Method and means of sequentially observing player positions in predetermined game plays. 4,117,606, Cl. 35-29.00R.

Purssell, Robert F.; Bhabra, Avtar S.; and Rossi, Guglielmo, to Ranco Incorporated. Snap action switch blades. 4,118,610, Cl. 200-67.0DA.

Putnam, Paul S.: *See*—
McCleskey, Robert W., Jr.; Putnam, Paul S.; and Boltad, Arne Martin, 4,117,941, Cl. 214-2.500.

Quikoton AG: *See*—
Godau, Eckhardt; and Schneider, Max, 4,118,183, Cl. 8-18.00R.

Quinci, Emanuel: *See*—
Konars, Clement R.; Schlipf, Frank J.; and Quinci, Emanuel, 4,118,025, Cl. 271-273.000.

Quintana, Elias D.: *See*—
Eckel, Leonard B.; Sullivan, James P.; and Quintana, Elias D., 4,117,783, Cl. 108-91.000.

Quinton Hazell Limited: *See*—
Baker, Peter Frederick, 4,117,916, Cl. 192-98.000.

Qume Corporation: *See*—
Grundherr, Willy J., 4,118,129, Cl. 400-144.200.

Qureshi, Azam S., to Tomco, Inc. Pressure compensated control valve. 4,117,862, Cl. 137-596.130.

R. J. Reynolds Tobacco Company: *See*—
McArthur, Colin Shaw; and Clark, Douglas Copeland, 4,118,619, Cl. 219-121.00L.

R.T. French Company, The: *See*—
Perryman, E. Firth, 4,118,518, Cl. 426-516.000.

Rabinow, Jacob, to United States of America, Army. Doppler distance measuring system. 4,118,702, Cl. 343-7.0PF.

Ragle, Herbert Underwood: *See*—
Gyi, Ko Ko; and Ragle, Herbert Underwood, 4,118,746, Cl. 360-99.000.

Raguin, Michel M.; and Joyce, Thomas F., to Honeywell Information Systems Inc. Microprogram memory bank addressing system. 4,118,773, Cl. 364-200.000.

Rahn, John P.; and Scott, Marion L., to United States of America, Navy. Laser tuning with an acousto-optic lens. 4,118,675, Cl. 331-94.50C.

Rahn, Oskar; and Krause, Hermann, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Tool for the contact-free support of discs. 4,118,058, Cl. 294-67.00B.

Raleigh, Douglas O.; and Topol, Leo E., to Rockwell International Corporation. Sensor for fluid components. 4,118,194, Cl. 422-98.000.

Ranco Incorporated: *See*—
Purssell, Robert F.; Bhabra, Avtar S.; and Rossi, Guglielmo, 4,118,610, Cl. 200-67.0DA.

Randon, Donald Gerard, to Roberts Management, Inc. Method of juggling and apparatus therefor. 4,118,030, Cl. 273-96.00R.

Rank Xerox, Ltd.: *See*—
Kito, Hidetoshi, 4,117,803, Cl. 118-658.000.

Ransburg Corporation: *See*—
Hoenig, Stuart A., 4,117,715, Cl. 73-28.000.

Rapko, John N., to Monsanto Company. N-acetyl diglycolimide. 4,118,568, Cl. 544-173.000.

Rapp, Willard Emanuel, to Western Electric Company, Inc. Wire lead and solder removal tool. 4,117,590, Cl. 29-764.000.

Rasmussen, Ross H. System and method for cooling hot water from industrial plant cooling use. 4,117,683, Cl. 405-61.000.

Rass, Inc.: *See*—
Helt, Raymond E., 4,117,609, Cl. 36-4.000.

Rasure, Rebecca Ann. Pediatric restraint garment. 4,117,840, Cl. 128-134.000.

Ratti, Mario, to S.U.S.T.A. S.p.A. Assembly for housing, conveying and bringing-forth tools during the operation of numerically controlled machines. 4,117,937, Cl. 211-60.00T.

Rauh, Jack K.: *See*—
Bucknell, Ernest H.; and Rauh, Jack K., 4,117,858, Cl. 137-119.000.

Raybestos Manhattan, Inc.: *See*—
Lowry, Blaine E., 4,118,528, Cl. 428-65.000.

Rayfield, Wilson Parker; Ferguson, Ronald Worden; and Brooks, George Mahue, to Burroughs Corporation. Bursting apparatus for continuous forms. 4,118,022, Cl. 270-52.500.

Raymond Lee Organization, Inc., The: *See*—
Bickford, Edgar, 4,117,614, Cl. 40-155.000.
Brubaker, Charles W., 4,118,043, Cl. 280-8.000.
Ward, Timothy J., 4,117,566, Cl. 15-244.00R.

RCA Corporation: *See*—
Dietz, Wolfgang Friedrich Wilhelm, 4,118,656, Cl. 315-371.000.
Hinn, Werner, 4,118,731, Cl. 358-65.000.
Lenihan, Thomas Francis, 4,118,700, Cl. 340-524.000.
Risko, John Joseph; and Napoli, Louis Sebastian, 4,118,598, Cl. 325-26.000.
Shanley, Robert Loren, II, 4,118,729, Cl. 358-10.000.
Shwartzman, Stanley; and Mayer, Alfred, 4,118,649, Cl. 310-337.000.

Rea, William L.: *See*—
Regelson, Ephraim; Terral, Leonard G.; Matusiak, Ronald J.; Trotter, Jerry L.; Rea, William L.; and Mangel, Edward L., 4,117,967, Cl. 228-20.000.

Recognition Equipment Incorporated: *See*—
McWaters, Lynn D.; and Parekh, Hersh B., 4,118,687, Cl. 340-146.3ED.

Red, Jerry F. P.; and Ilagan, Juan B., Jr., to SCM Corporation. Fatty acid recovery from soapstock. 4,118,407, Cl. 260-412.500.

Redman, Charles M., to United States of America, Army. Method and apparatus for driving an optical waveguide with conherent radiation. 4,118,676, Cl. 332-7.510.

Reed, Robert D., to John Zink Company. Apparatus for indicating true furnace draft. 4,117,734, Cl. 73-756.000.

Rees, Herbert; and Schad, Robert Dietrich, to Husky Injection Molding Systems Limited. Guidance system for shallow articles discharged from a mold cavity. 4,118,168, Cl. 425-556.000.

Rees, James D.; and Lehman, Richard F., to Xerox Corporation. Method of rendering objects uncopyable by photocopy processes. 4,118,122, Cl. 355-77.000.

Reese, Gunter; Kroke, Hermann; and Scheuermann, Fanny, to Henkel Kommanditgesellschaft auf Aktien. Film-forming vinyl acetate copolymerizates in an improved process for setting hair and as hair setting agents. 4,117,853, Cl. 132-7.000.

Regel, Erik; Draber, Wilfried; Buchel, Karl Heinz; and Plempel, Manfred, to Bayer Aktiengesellschaft. Substituted azol-1-ylmethanes. 4,118,487, Cl. 424-232.000.

Regelson, Ephraim; Terral, Leonard G.; Matusiak, Ronald J.; Trotter, Jerry L.; Rea, William L.; and Mangel, Edward L., to United States of America, Navy. Solder extractor apparatus. 4,117,967, Cl. 228-20.000.

Reichman, Joseph: *See*—
Witzke, Horst; Chen, Schoen-nan; Deb, Satyendra K.; Jost, Steven Robert; Reichman, Joseph; and Russak, Michael A., 4,118,547, Cl. 429-111.000.

Reiff, Helmut F.; and Pantone, Richard S., to Mobay Chemical Corporation. Low-temperature storage stable liquid diphenylmethane diisocyanates. 4,118,411, Cl. 260-453.0SP.

Reinhall, Rolf Bertil. Device for use in beating or refining machines. 4,118,800, Cl. 366-341.000.

Reinhardt, Gerd: *See*—
Schnabel, Eugen; Schlumberger, Horst Dieter; Reinhardt, Gerd; Truscheit, Ernst; and Tschesche, Harald, 4,118,481, Cl. 424-177.000.

Reinhardt, Victor S., to United States of America, National Aeronautics and Space Administration. Time domain phase measuring apparatus. 4,118,665, Cl. 324-57.00R.

Reinheimer, Gunter: *See*—
Leiter, Herbert; and Reinheimer, Gunter, 4,118,719, Cl. 354-79.000.

Reinwald, Elmar; and Schwuger, Milan Johann, to Henkel Kommanditgesellschaft auf Aktien. Method of washing textiles. 4,118,189, Cl. 8-137.000.

Rekers, Louis J., to National Distillers and Chemical Corporation. Novel polymerization catalyst. 4,118,340, Cl. 252-428.000.

Remington Arms Company, Inc.: *See*—
Linde, John P.; Kopinski, Martin W.; and Lewis, Donald R., 4,117,617, Cl. 42-1.00S.

Renaut, Henry, to Lemaire & Cie. Calenders for the thermal treatment of laminar material. 4,117,699, Cl. 68-5.00D.

REPA Feinstanzwerk GmbH: *See*—
Fohl, Artur, 4,118,068, Cl. 297-385.000.

Research Corporation: *See*—
Caldwell, Harlan D.; Kuo, Cho-Chou; and Kenny, George E., 4,118,469, Cl. 424-1.000.

Research Institute for Iron, Steel and Other Metals of the Tohoku University, The: *See*—
Hirai, Toshio; and Niihara, Koichi, 4,118,539, Cl. 428-446.000.

Rettger, Harry C.: *See*—
Kolesar, Mark; and Rettger, Harry C., 4,117,707, Cl. 72-306.000.

Reuter, Franz Gottfried: *See*—
Friedel, Franz Lutz; Schone, Armin; and Reuter, Franz Gottfried, 4,118,410, Cl. 260-453.0AM.

Reynolds, Mark P.: *See*—
Ladin, Eli M.; and Reynolds, Mark P., 4,117,917, Cl. 192-98.000.

Rhein-Nadel Maschinennadel GmbH: *See*—
Pavel, Klaus, 4,117,930, Cl. 206-382.000.

Rhein, Robert A.; and Ingham, John D., to California Institute of Technology. Curable liquid hydrocarbon prepolymers containing hydroxyl groups and process for producing same. 4,118,427, Cl. 568-852.000.

Rhone-Poulenc Industries: *See*—
Desire, Pierre; and Helgorsky, Jacques, 4,118,462, Cl. 423-321.00S.

Rhone-Poulenc S.A.: *See*—
Marze, Xavier, 4,118,439, Cl. 260-858.000.

Ricard, Jean-Paul: *See*—
Baudet, Pierre; Ricard, Jean-Paul; and Schulthess, Adrian, 4,118,583, Cl. 560-63.000.

Ricci-Bitti, Roberto: *See*—
Barisoni, Mario; Barteri, Massimo; Ricci-Bitti, Roberto; Marianeschi, Edmondo G. A.; Basevi, Sandro C.; Borgianni, Carlo; and Santafe, Carlo, 4,118,255, Cl. 148-111.000.

Richardson, Carl; Stoddart, Hugh F.; and Wiley, Philip A., to Bedford Engineering Corp. Apparatus for and method of measuring product mass. 4,117,935, Cl. 209-586.000.

Richardson, William Stanley, to Motorola, Inc. Higher density insulated gate field effect circuit. 4,118,642, Cl. 307-238.000.

Richter, Heinrich: *See*—
Neeb, Karl-Heinz; and Richter, Heinrich, 4,118,317, Cl. 210-32.000.

Richter, Rolf, to Xodar Corporation. Aerator containing a ballast charge. 4,118,447, Cl. 261-122.000.

Richter, Sidney B.: *See*—
Hotz, Roger D.; Stach, Leonard J.; and Richter, Sidney B., 4,118,216, Cl. 71-88.000.

Ricke, Cyril T., to Hex Fastener Corporation. Apparatus for shading the seats of a vehicle. 4,118,066, Cl. 297-184.000.

Ricoh Company, Ltd.: *See*—
Koizumi, Yutaka; and Hashimoto, Kenji, 4,118,117, Cl. 355-8.000.
Ogawa, Toshiya; Niki, Akio; Uchimura, Kazuo; and Tsuruoka, Koichi, 4,118,695, Cl. 340-324.0AD.
Tomita, Satoru; Ohori, Tamio; Karasawa, Shuichi; and Ohta, Wasaburo, 4,118,710, Cl. 346-153.000.

Ridley, Richard D.: *See*—
French, Gordon B.; and Ridley, Richard D., 4,118,070, Cl. 299-2.000.

Riebel, Hans-Jochem: *See*—
Maurer, Fritz; Riebel, Hans-Jochem; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,118,486, Cl. 424-212.000.

Riehl, Fred, to Robertshaw Control Company. Fuel burner, arrangement and sleeve therefor and methods. 4,118,175, Cl. 431-354.000.

Rienzo, Donald D., to Allan Tackle Manufacturing Co., Inc. Self-balancing tray. 4,117,965, Cl. 224-48.00R.

Rietzel, Christian: *See*—
Voelger, Karl-Dieter; Rietzel, Christian; and Lehmann, Klaus, 4,118,492, Cl. 424-251.000.

Rigbi, Meir; Klausner, Yakir; Lefrancier, Pierre; and Sache, Edgar, to Choay S.A. Derivatives of para-guanidino-L-phenylalanine and methods of preparing them. 4,118,575, Cl. 560-13.000.

Right, Robert W., to General Signal Corporation. Base loop code transmitter. 4,118,694, Cl. 340-293.000.

Riken Keikinzoku Kogyo Kabushiki Kaisha: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,117,703, Cl. 72-38.000.

Rinaldo, Kenneth D., to Fairchild Camera and Instrument Corporation. Pin extender strip for vertically mounting multi-pin electronic devices. 4,118,757, Cl. 361-404.000.

Rinde, James A., to United States of America, Energy. Method of making a cellulose acetate low density microcellular foam. 4,118,449, Cl. 264-28.000.

Risko, John Joseph; and Napoli, Louis Sebastian, to RCA Corporation. Amplitude modulated impatt diode oscillator and a low cost communication system using same. 4,118,598, Cl. 325-26.000.

Ritter, Gerhard: *See—*
Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,117,872, Cl. 140-57.000.

Ritter, Josef: *See—*
Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,117,872, Cl. 140-57.000.

Ritter, Klaus: *See—*
Gott, Hans; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,117,872, Cl. 140-57.000.

Ritzmann, Horst: *See—*
Mollenkopf, Hans; Ritzmann, Horst; Wurr, Jurgen; Schmits, Heinz-Berbert; Heinemann, Otto; Krutzner, Karl, jun.; and Schossler, Werner, 4,118,176, Cl. 432-14.000.
Weber, Paul; Lankes, Erich; Butschko, Gerhard; Ritzmann, Horst; and Bohm, Peter Wolfgang, 4,118,177, Cl. 432-14.000.

Robert Bosch GmbH: *See—*
Bodig, Bernd; Schmied, Helmut; and Hohne, Gerd, 4,117,818, Cl. 123-148.00E.
Fleischer, Helmut; and Schneider, Erich, 4,117,903, Cl. 180-105.00E.
Leibundgut, Gottfried, 4,118,614, Cl. 200-157.000.
Leibundgut, Gottfried, 4,118,615, Cl. 200-157.000.

Roberts, Charles Sheldon, to Bell Telephone Laboratories, Incorporated. Associative information retrieval. 4,118,788, Cl. 364-900.000.

Roberts Management, Inc.: *See—*
Randon, Donald Gerard, 4,118,030, Cl. 273-96.00R.

Robertshaw Control Company: *See—*
Riehl, Fred, 4,118,175, Cl. 431-354.000.

Robertson, Thomas Alexander. Cooking stand. 4,117,825, Cl. 126-29.000.

Robeson, Terrence R. Collapsible folding rocking chair. 4,118,064, Cl. 297-18.000.

Robin Products Company: *See—*
Bullock, Paul, 4,117,568, Cl. 16-110.00R.

Robinson, Graham: *See—*
Jones, Ivor Wynn; and Robinson, Graham, 4,118,545, Cl. 429-104.000.

Robinson, John William: *See—*
Osburn, James Patrick; and Robinson, John William, 4,117,758, Cl. 84-1.010.

Robinson, Murry C. Separating magnesium and calcium from mineral mixtures containing zinc sulphides. 4,118,458, Cl. 423-109.000.

Robinson, William Henry. Cyclic shear energy absorber. 4,117,637, Cl. 52-167.000.

Roblin Industries, Inc.: *See—*
Celms, Harry, 4,118,044, Cl. 280-33.99F.

Robson, Clive Gilroy: *See—*
Drewe, Nigel Wyndham; Hodson, Peter Robin; and Robson, Clive Gilroy, 4,118,218, Cl. 71-92.000.

Rockwell International Corporation: *See—*
Hamilton, C. Howard; and Ascani, Leonard A., Jr., 4,117,970, Cl. 228-173.00A.
Raleigh, Douglas O.; and Topol, Leo E., 4,118,194, Cl. 422-98.000.

Roeder, George K. Hydraulically actuated pump assembly. 4,118,154, Cl. 417-402.000.

Rohm GmbH: *See—*
Voelger, Karl-Dieter; Rietzel, Christian; and Lehmann, Klaus, 4,118,492, Cl. 424-251.000.

Rohm and Haas Company: *See—*
Miller, George A.; and Chan, Hak-Foon, 4,118,461, Cl. 424-273.00R.

Rohr Industries, Inc.: *See—*
Atkinson, Thomas Carl; and Fay, Clifford C., 4,118,061, Cl. 296-63.000.

Rokadia, Abdullah M.: *See—*
Devona, James E.; and Rokadia, Abdullah M., 4,118,356, Cl. 260-29.6RB.

Roland Corporation: *See—*
Akamatu, Keiji, 4,117,757, Cl. 84-1.010.

Rollo, Charles: *See—*
Perrotta, Anthony; and Rollo, Charles, 4,117,841, Cl. 128-155.000.

Rolls-Royce Limited: *See—*
Newman, Paul; and Sargent, Raymond Fredrick, 4,118,079, Cl. 308-9.000.

Romerswinkel, Heinrich-Wilhelm: *See—*
Gruner, Hans; Terjung, Klaus; Sachse, Wolfgang; and Romerswinkel, Heinrich-Wilhelm, 4,118,018, Cl. 266-275.000.

Rommele, Gunter; and Hagemann, Ruth, to Ciba-Geigy Corporation. Preparation of a stablized papain solution. 4,118,515, Cl. 426-63.000.

Rosenbaum, Georges: *See—*
Vanlerberghe, Guy; and Rosenbaum, Georges, 4,118,423, Cl. 260-584.00A.

Rosenbloom, William J. Electric manicure. 4,117,854, Cl. 132-75.800.

Rosengren, Ake: *See—*
Eriksson, Jan-Christer; Larsson, Rolf; Rosengren, Ake; and Hjelte, Maj-Britt, 4,118,485, Cl. 424-183.000.

Rosey, Richard; Kovatch, George N.; and Simon, Ned H., to Westinghouse Electric Corp. Electrical switchboard apparatus including bus system with individual phase isolation. 4,118,639, Cl. 307-147.000.

Rosin, Erwin August: *See—*
Dombkowsi, Walter Stephen; and Rosin, Erwin August, 4,117,670, Cl. 60-39.28T.

Ross, John: *See—*
Klein, Fritz S.; and Ross, John, 4,118,296, Cl. 204-157.10R.

Rossi, Alfred F. Flexible pouch, forming, filling and sealing machine. 4,117,647, Cl. 53-502.000.

Rossi, Guglielmo: *See—*
Purssell, Robert F.; Bhabra, Avtar S.; and Rossi, Guglielmo, 4,118,610, Cl. 200-67.0DA.

Rotec Industries: *See—*
Oury, Robert F., 4,117,920, Cl. 198-311.000.

Rovin, Herman; Levine, Lawrence J.; Opuszenski, Theodore; Pellicano, Joseph; and Swenson, Alan F., to Automatech Industries, Inc. Automatic, in situ bobbin spool loading. 4,117,789, Cl. 112-181.000.

Row, Deborah. Matrix game apparatus. 4,118,035, Cl. 273-243.000.

Rowe, Edward A., Jr.; and Cawley, William H., to Diamond Shamrock Corporation. Non-flammable solvent phosphatizing compositions yielding non water soluble coatings. 4,118,253, Cl. 148-6.15R.

Rowley, Roger James: *See—*
Dawes, Keith; and Rowley, Roger James, 4,118,367, Cl. 260-42.370.

Ruckl, Siegfried, to Schablonentechnik Kufstein GmbH. Method of producing a perforated metal foil, especially for screen printing. 4,118,288, Cl. 204-11.000.

Rudewick, Charles J.: *See—*
Lagarelli, Carmen J.; and Rudewick, Charles J., 4,117,979, Cl. 239-381.000.

Ruf, Erich; and Loges, Hans, to Th. Goldschmidt AG. Process for producing tin (II) sulfate. 4,118,293, Cl. 204-93.000.

Ruffner, Frederick G.; and Bair, Frank E., to Ruffner, Frederick G. Page model for printing. 4,118,120, Cl. 355-75.000.

Ruiz, Carlos Santiago. Multi-hull self rescuing system. 4,117,795, Cl. 114-68.000.

Runge, Thomas M. Aircraft wing lift augmentation device. 4,117,995, Cl. 244-207.000.

Rupp, Ludwig; and Mayer, Hubert, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Centrifugal disk separation device for a disk clutch. 4,117,919, Cl. 192-103.00A.

Ruppe, Joseph P., Jr., to Bendix Corporation, The. Means for reducing the gap between rotor-backing plate interface during brake depressurization. 4,117,912, Cl. 188-216.000.

Rupprecht, Hans Stephan: *See—*
Horng, Cheng Tzong; Michel, Alwin Earl; Rupprecht, Hans Stephan; and Schwenker, Robert Otto, 4,118,250, Cl. 148-1.500.

Rupprecht, Manfred: *See—*
Klein, Hans-Joachim; Rupprecht, Manfred; Wonneberg, Heinz; Geiger, Julius; and Masa, Gunter, 4,118,127, Cl. 356-200.000.

Rushman, Reginald, to Parks-Cramer (Great Britain) Ltd. Oil mist lubricated textile machine and method. 4,117,869, Cl. 139-1.00R.

Russak, Michael A.: *See—*
Witzke, Horst; Chen, Schoen-nan; Deb, Satyendra K.; and Russak, Michael A., 4,118,546, Cl. 429-111.000.
Witzke, Horst; Chen, Schoen-nan; Deb, Satyendra K.; Jost, Steven Robert; Reichman, Joseph; and Russak, Michael A., 4,118,547, Cl. 429-111.000.

Russo, Alberto. Oil tank cleaning apparatus. 4,117,564, Cl. 15-1.700.

Rutherford, Kenneth S., to United States Steel Corporation. Fixture for use in positioning the walls of an adjustable continuous-casting mold. 4,117,879, Cl. 164-412.000.

Ruthner Industrieanlagen-Aktiengesellschaft: *See—*
Fuchs, Heribert, 4,117,978, Cl. 239-112.000.

Ryan, Michael J., to United States of America, Energy. Reusable, tamper-indicating seal. 4,118,057, Cl. 292-307.00R.

Rypkema, Jouke N., to Zenith Radio Corporation. Surface wave AFC discriminator with two zero crossings. 4,118,740, Cl. 358-195.000.

S.A.M.P.R.E. S.p.A.: *See—*
Fusaroli, Goffredo, 4,117,572, Cl. 19-244.000.

S.U.S.T.A. S.p.A.: *See—*
Ratti, Mario, 4,117,937, Cl. 211-60.00T.

Sache, Edgar: *See—*
Rigbi, Meir; Klausner, Yakir; Lefrancier, Pierre; and Sache, Edgar, 4,118,575, Cl. 560-13.000.

Sachot, Michel E., to Societe Hure S.A. Machine tools with sliding tool-holding ram. 4,117,762, Cl. 90-11.00F.

Sachse, Wolfgang: *See—*
Gruner, Hans; Terjung, Klaus; Sachse, Wolfgang; and Romerswinkel, Heinrich-Wilhelm, 4,118,018, Cl. 266-275.000.

Sado, Ryoichi; and Tahara, Kazutoki, to Shin-Etsu Polymer Co., Ltd. Interconnectors. 4,118,092, Cl. 339-59.00M.

Saeman, Walter C., to Olin Corporation. Granular calcium hypochlorite by spray graining. 4,118,524, Cl. 427-213.000.

Safir, Sidney Robert: *See—*
Fanshawe, William Joseph; Safir, Sidney Robert; and Crawley, Lantz Stephen, 4,118,393, Cl. 260-326.50B.

Sagaser, Thomas M.; and Mather, Joseph M., to Clark Equipment

Company. Hydraulic system for a skid-steer loader. 4,117,899, Cl. 180-6.480.

Sage, Howard M.; and Abromavage, John C., to U-Haul International, Inc. Car top carrier assembly. 4,117,964, Cl. 224-42.10E.

Saint-Gobain Industries: *See—*
Brax, Jean Albert, 4,118,215, Cl. 65-134.000.
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,118,213, Cl. 65-5.000.

Sakurada, Nobuaki: *See—*
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Masaharu; and Shinoda, Nobuhiko, 4,118,713, Cl. 354-23.00D.
Suzuki, Masayuki; Sakurada, Nobuaki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyashu, 4,118,716, Cl. 354-38.000.

Sala International AB: *See—*
Bogen, Jan O., 4,118,321, Cl. 210-91.000.

Salle, Robert; and Sillion, Bernard, to Institut Francais du Petrole. Dicarboxylic compounds and polyesters derived therefrom. 4,118,392, Cl. 260-326.00N.

Salva, John P.; Mudzinski, Gregory M.; Mills, John A.; and Dewan, Shashi B., to Firing Circuits Inc. Control circuit for shuttle car. 4,118,658, Cl. 318-257.000.

Sanders Associates, Inc.: *See—*
Topliffe, Roger O., 4,117,729, Cl. 73-516.0LM.

Sandesara, Mahendra D., to Waste Management of Illinois, Inc. Process for disposal of arsenic salts. 4,118,243, Cl. 106-109.000.

Sandow, Jurgen: *See—*
Konig, Wolfgang; Geiger, Rolf; and Sandow, Jurgen, 4,118,483, Cl. 424-177.000.

Sankyo Company Limited: *See—*
Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,118,368, Cl. 260-45.80N.

Sannel, Benjamin H.: *See—*
Burg, John S.; Davidson, Donald M.; McClure, Marvin K.; and Sannel, Benjamin H., 4,117,604, Cl. 34-70.000.

Sannes, Keith N.; and Factor, Arnold, to General Electric Company. Color-stabilized halobisphenol ethylene polycarbonates. 4,118,370, Cl. 260-45.75W.

Sano, Masaru; and Kashima, Koji, to Nittetu Chemical Engineering Ltd.; and Toa Oil Co., Ltd. Treatment of gas containing hydrogen sulfide. 4,118,467, Cl. 423-573.00R.

San Roman, Guillermo A., to Hydrotechnic Corporation. Filtering apparatus for liquids. 4,118,322, Cl. 210-136.000.

Sansui Electric Co., Ltd.: *See—*
Kobayashi, Fumio, 4,118,605, Cl. 179-115.5VC.

Santafe, Carlo: *See—*
Barisoni, Mario; Barteri, Massimo; Ricci-Bitti, Roberto; Marianeschi, Edmondo G. A.; Basevi, Sandro C.; Borgianni, Carlo; and Santafe, Carlo, 4,118,255, Cl. 148-111.000.

Sargent Industries: *See—*
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Sargent, Raymond Fredrick: *See—*
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Sarson, Alan Elmer; and Clark, William James Rowley, to Elliott Brothers (London) Limited. Surveillance arrangement including a television system and infrared detector means. 4,118,733, Cl. 358-109.000.

Sato, Masaaki, to Olympus Optical Co., Ltd. Tape end detection release device for tape recorder. 4,118,744, Cl. 360-74.000.

Sato, Naohiko; and Osawa, Keiichi, to Honda Giken Kogyo Kabushiki Kaisha. Auxiliary fuel feed and timing control system for internal combustion engines. 4,117,812, Cl. 123-117.00A.

Sato, Takahisa: *See—*
Suzuki, Hideo; Sato, Takahisa; Kubota, Tatsuo; Osaka, Shigemi; and Komatsu, Shigeru, 4,118,402, Cl. 260-346.750.

Saunders, Charlie H. Locking arrangement for radios or the like. 4,117,700, Cl. 70-58.000.

Saunders, Daniel, to Mining Equipment Division, a division of FMC Corporation. Drill steel guide for a mine drilling machine. 4,117,894, Cl. 173-23.000.

Saurer, Eric; and Laesser, Claude, to Ebauches S.A. Passive electro-optic display cell and method for manufacturing it. 4,118,110, Cl. 350-334.000.

Sawa, Kenneth Bruno: *See—*
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Sawai, Masanobu; Sudo, Tadamitsu; and Enomoto, Shogo, to Mitsubishi Chemical Industries Limited. Method and apparatus for the measurement of antigens and antibodies. 4,118,192, Cl. 424-12.000.

Scapes, John N., to Gould Inc. Valve structure. 4,118,007, Cl. 251-223.000.

Scarfe, Arthur; and Smith, John Cambridge, to Fletcher Sutcliffe Wild Limited. Mine roof supports. 4,117,687, Cl. 405-292.000.

Schabert, Hans-Peter; Bremer, Hans; and Strickroth, Erich, to Kraftwerk Union Aktiengesellschaft. Steel containment for nuclear reactor installations. 4,118,277, Cl. 176-87.000.

Schablonentechnik Kufstein GmbH: *See—*
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Schad, Robert Dietrich: *See—*
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Schadow, Rudolf; and Hinze, Klaus, to ITT Industries, Inc. Electrical snap-action switch. 4,118,609, Cl. 200-67.0DA.

Schaefgen, John Raymond, to Du Pont de Nemours, E. I., and Company. Aromatic copolyester capable of forming an optically anisotropic melt. 4,118,372, Cl. 528-190.000.

Schatz, Klaus Wilhelm: *See—*
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Gross, Benjamin; and Schatz, Klaus Wilhelm, 4,118,338, Cl. 252-417.000.

Schaumann, Peter H. Water walker. 4,117,562, Cl. 9-310.00D.

Schaus, John Joseph, to Whirlpool Corporation. Method of controlling foaming of cabinet insulation. 4,118,451, Cl. 264-46.500.

Scheidl, Franz: *See—*
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Schenk, Peter, to Dzus Fastener Co. Inc. Fastener for shipping container. 4,117,928, Cl. 206-320.000.

Scherf, Gerhard Wolfgang Helmut, to Canadian D. A. Stuart Oil Co. Limited. Acetals of glyoxal and terephthaldehyde. 4,118,565, Cl. 544-87.000.

Schering Aktiengesellschaft: *See—*
Philippson, Rainer; Krieger, Bernhard; Casals-Stenzel, Jorge; Kerb, Ulrich; Losert, Wolfgang; Prezewowsky, Klaus; Wiechert, Rudolf; and Bittler, Dieter, 4,118,488, Cl. 424-238.000.

Schertz, Charles J.; and Wilson, Dennis L., to United States of America, Army. Feed pawl antibounce device. 4,117,760, Cl. 89-33.00C.

Schertz, William W.: *See—*
Graven, Robert M.; Gorski, Anthony J.; Schertz, William W.; and Grase, Johan E. A., 4,118,249, Cl. 136-89.0PC.

Scheuermann, Fanny: *See—*
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Schieber, Franz, to C. Conradty Nurnberg GmbH & Co. KG. Carbon electrode and other shaped carbon bodies. 4,118,592, Cl. 13-18.00R.

Schilling, Gunter: *See—*
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Schimmer, Rigobert: *See—*
Oberreuter, Theodor; Schimmer, Rigobert; and Seifert, Wilhelm, 4,118,257, Cl. 148-187.000.

Schipman, Jean-Marie. Refuse container, and refuse compacting and discharging device therefor. 4,117,777, Cl. 100-215.000.

Schiwy, Willy: *See—*
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Schlichte, Max, to Siemens Aktiengesellschaft. Switching arrangement for converting analog signals into digital signals and digital signals into analog signals. 4,118,697, Cl. 340-347.00C.

Schlipf, Frank J.: *See—*
Konars, Clement R.; Schlipf, Frank J.; and Quinci, Emanuel, 4,118,025, Cl. 271-273.000.

Schlumberger, Horst Dieter: *See—*
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Schlumberger Technology Corporation: *See—*
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Schmelzer Corporation: *See—*
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Schmid, Wehrhart: *See—*
Hadamovsky, Eugen; Hoppe, Wolfgang; Overhausen, Hans-Walter; Piotrowski, Bernhard; Schmid, Wehrhart; Schreiber, Georg; and Schroeder, Heinz, 4,118,313, Cl. 560-78.000.

Schmidt, Donald L.: *See—*
Broxterman, William E.; Urchick, Demetrius; Schmidt, Donald L.; and Hoornstra, Clayton W., 4,118,297, Cl. 204-159.110.

Schmidt, Gustav A.: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,118,442, Cl. 260-885.000.

Schmidt, Henning Falck. Lift mechanism with platform locking device. 4,118,011, Cl. 254-124.000.

Schmidt, Klaus: *See—*
Brose, Horst; Depping, Karl Dieter; Hentschel, Dietrich; Kostevc, Bernard; and Schmidt, Klaus, 4,118,366, Cl. 260-40.00R.

Schmidtberger, Rudolf, to Behringwerke Aktiengesellschaft. Amidated immune globulins and process for preparing them. 4,118,379, Cl. 260-112.00B.

Schmied, Helmut: *See—*
Bodig, Bernd; Schmied, Helmut; and Hohne, Gerd, 4,117,818, Cl. 123-148.00E.

Schmits, Heinz-Berbert: *See—*
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Schmitt-Thomas, Karlheinz G.; Lipp, Alfred; and Schwetz, Karl, to Electroschmelzwerk Kempten GmbH. Process for the production of oxygen-free copper casting and moldings. 4,118,256, Cl. 148-160.000.

Schmitt, Wilhelm: *See—*
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Schnabel, Eugen; Schlumberger, Horst Dieter; Reinhardt, Gerd; Truscheit, Ernst; and Tschesche, Harald, to Bayer Aktiengesellschaft. Deamino derivatives of the kallikrein-trypsin inhibitor. 4,118,481, Cl. 424-177.000.

Schneider, Erich: *See—*
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Schneider, Max: *See—*
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Schnitzius, Klaus, to Stabilus GmbH. Pneumatic spring. 4,118,131, Cl. 403-24.000.
Schnurrenberger, Hermann, to Franz Volkl oHG. Ski having a three-dimensional running surface. 4,118,050, Cl. 280-604.00'.
Scholes, Addison B., to Ball Corporation. Pre-primed fuel and method and apparatus for its manufacture. 4,118,202, Cl. 44-6.000.
Schone, Armin: *See*—
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Schossler, Werner: *See*—
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Schuller, Joris Maarten: *See*—
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Schulte Elektrotechnik KG, Firma: *See*—
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Schulte, Siegfried; and Schmitt, Wilhelm, to Schulte Elektrotechnik KG, Firma. Electrical machinery. 4,118,644, Cl. 310-42.000.
Schulthess, Adrian: *See*—
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Schulze, Heinz: *See*—
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Schuster, Hubert: *See*—
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Schutz, Karl Heinz, to SKF Kugellagerfabriken GmbH. Measuring friction bearings. 4,117,719, Cl. 73-141.00A.
Schwarz, Gerhard, to Microtherm GmbH, Firma. Resettable thermal safety switch. 4,118,683, Cl. 337-91.000.
Schwenker, Robert Otto: *See*—
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Schwetz, Karl: *See*—
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SCM Corporation: *See*—
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Scott, Marion L.: *See*—
Rahn, John P.; and Scott, Marion L., 4,118,675, Cl. 331-94.50C.
Scott, Samuel Clyde. Concrete beam form. 4,118,004, Cl. 249-50.000.
Scott, Warner Curtis, to Texas Instruments Incorporated. Internally supported flat tube display. 4,118,650, Cl. 313-422.000.
Scott, Warner Curtis, to Texas Instruments Incorporated. Internally supported flat tube display. 4,118,651, Cl. 313-422.000.
Searle, Robert J. G.: *See*—
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Seifert, Wilhelm: *See*—
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Seisan Kaihatsu Kagaku Kenkyusho: *See*—
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Sekhon, Kalwant S.: *See*—
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Seki, Masao: *See*—
Yamada, Yasuo; and Seki, Masao, 4,118,104, Cl. 350-3.600.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Shiohara, Tomoo; Miyamoto, Minoru; and Tamaki, Nobuo, 4,118,227, Cl. 106-306.000.
Seko, Maomi; Miyake, Tetsuya; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Redox uranium isotope separation using anion exchangers. 4,118,457, Cl. 423-7.000.
Sellors, Thomas J., to Potlatch Corporation. Multi-celled carton with self-locking feature. 4,117,972, Cl. 229-28.00R.
Selwitz, Charles M.; and Thayer, Helen I., to Gulf Research & Development Company. Paraffin wax composition. 4,118,244, Cl. 106-270.000.
Semler, Eleonore Josephine: *See*—
Semler, Oskar A., 4,117,556, Cl. 4-325.000.
Semler, Oskar A., to Semler, Eleonore Josephine. Flush water conserver. 4,117,556, Cl. 4-325.000.
Semmler, Hans-Joachim; and Felix, Bernd, to Hoechst Aktiengesellschaft. Process for the preparation of perfluoroethyl iodide. 4,118,290, Cl. 204-59.00F.
Sentinel Distributors, Inc.: *See*—
Mills, J. T., 4,117,822, Cl. 123-198.0DB.
Septier, Jacqueline. Method for making a tennis, badminton or similar racket net, net obtained by this method and racket comprising this net. 4,118,029, Cl. 273-73.00D.
Serkez, Alvin A. Handbag holder. 4,118,001, Cl. 248-308.000.
Service Ideas, Inc.: *See*—
Collins, Harry F., 4,117,948, Cl. 220-410.000.
Sesser, George L.: *See*—
Olsen, James A.; Butler, Gene R.; and Sesser, George L., 4,117,942, Cl. 214-6.00B.
Seufert, Wilhelm: *See*—
Gnadig, Gerhard; and Seufert, Wilhelm, 4,117,583, Cl. 29-447.000.
Seugnet, Monique, to Colgate Palmolive Company. Fabric softener and anti-static compositions. 4,118,327, Cl. 252-8.800.
Shaffer, Howard R., to I-T-E Imperial Corporation. Interlock means for switch enclosure. 4,118,607, Cl. 200-50.00A.
Shaffer, Howard R.: *See*—
Kussy, Frank W.; and Shaffer, Howard R., 4,118,608, Cl. 200-56.00R.
Shaikevich, Stanislava Stanislavovna: *See*—
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Zjukin, Nikolai Stepanovich; Kostjuk, Boris Dmitrievich; Shaikevich, Stanislava Stanislavovna; Motsak, Yaroslav Feodosievich; Fedulaev, Vitaly Pavlovich; Kolchemanov, Nikolai Alexandrovich; Ugarov, Valentin Mikhailovich; Losev, Viktor Vasilievich; Drui, Mark Simonovich; Lavrinovich, Alla Alexandrovna; Shpotakovsky, Dmitry Fedorovich; and Chizhov, Stanislav Viktorovich, 4,117,968, Cl. 228-124.000.
Shakiba, Hosein M., to Lebidine, Samuel, a part interest. Unidirectional seal for flow passages. 4,118,173, Cl. 431-202.000.
Shanley, Robert Loren, II, to RCA Corporation. Set-up arrangement for a color television receiver. 4,118,729, Cl. 358-10.000.
Shaw, David G.; and Shedigian, Vandos, to General Electric Company. Method of impregnating a capacitor. 4,117,579, Cl. 29-25.420.
Shedigian, Vandos: *See*—
Shaw, David G.; and Shedigian, Vandos, 4,117,579, Cl. 29-25.420.
Shell Oil Company: *See*—
Anderson, Martin; and Brinnand, Antony G., 4,118,489, Cl. 424-246.000.
Beardmore, James W.; and Goehring, Daniel, 4,118,203, Cl. 44-7.500.
Carr, John B., 4,118,507, Cl. 424-278.000.
Davis, Royston H.; and Searle, Robert J. G., 4,118,510, Cl. 424-305.000.
Harris, Howard A., 4,118,385, Cl. 260-175.000.
Joustra, Annie H.; La Haye, Teunis P.; and Kesselaar, Fernand H., 4,118,428, Cl. 260-663.000.
Wood, Derek A., 4,118,413, Cl. 260-465.00D.
Sheller-Globe Corporation: *See*—
Byrn, James H., 4,118,455, Cl. 264-129.000.
Shemper, Leonid Isaakovich: *See*—
Koshelenko, Gennady Petrovich; Pasynkov, Rafail Moiseevich; Sin, Mikhail Alexandrovich; and Shemper, Leonid Isaakovich, 4,117,770, Cl. 92-57.000.
Sherman, Irving R. Variable aerodynamic compression flaps. 4,117,996, Cl. 244-212.000.
Sherstinsky, Semen Markovich: *See*—
Kopelev, Fridrikh Lvovich; Kossek, Valentin Vladimirovich; Dubinenko, Askold Fedorovich; and Sherstinsky, Semen Markovich, 4,117,750, Cl. 82-30.000.
Shibata, Toshihiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,118,369, Cl. 260-45.80N.
Shigeta, Masayuki: *See*—
Nara, Toshihiko; Mitsui, Norihiko; and Shigeta, Masayuki, 4,117,908, Cl. 187-20.000.
Shikoky Kaken Kogyo Kabushiki Kaisha: *See*—
Nakamura, Ryuji; and Motogi, Hideo, 4,118,450, Cl. 264-43.000.
Shima, Yoshiharu, to Nissei Plastics Industrial Co., Ltd. Injection molded ski and method for producing the same. 4,118,051, Cl. 280-610.000.
Shimada, Minoru: *See*—
Hasegawa, Yoshio; Hiroyama, Koji; Shimada, Minoru; and Kawasaki, Haruhiko, 4,117,790, Cl. 112-205.000.
Shimanuki, Kazuo: *See*—
Watanabe, Takeshi; Nishimaki, Kazuo; Shimanuki, Kazuo; Mita, Katuo; and Konno, Satoru, 4,118,210, Cl. 65-2.000.
Shimizu, Eisaku, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece calendar circuit. 4,117,657, Cl. 58-4.00A.
Shimizu, Toyoaki, to Nikkey Co., Ltd. Door closer. 4,117,567, Cl. 16-50.000.
Shimoda, Misao: *See*—
Hanaoka, Naohiro; and Shimoda, Misao, 4,118,747, Cl. 360-121.000.
Shin-Etsu Polymer Co., Ltd.: *See*—
Sado, Ryoichi; and Tahara, Kazutoki, 4,118,092, Cl. 339-59.00M.
Shinjo, Masayoshi: *See*—
Horiuchi, Norio; Kai, Shin-ichi-ro; and Shinjo, Masayoshi, 4,118,235, Cl. 106-38.220.

Shinoda, Nobuhiko: *See*—
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Masaharu; and Shinoda, Nobuhiko, 4,118,713, Cl. 354-23.00D.

Shiohara, Tomoo; Miyamoto, Minoru; and Tamaki, Nobuo, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Process for producing dicalcium silicate power. 4,118,227, Cl. 106-306.000.

Shirak, Michael. Wick lighter with wax holder. 4,118,174, Cl. 431-289.000.

Shishido, Toshimasa; and Ninomiya, Mitsuaki, to Kabushiki Kaisha Keihinseiki Seisakusho; and Honda Giken Kogyo Kabushiki Kaisha. Sliding throttle valve type carburetor. 4,118,445, Cl. 261-44.00B.

Shoemaker, Paul D.: *See*—
Sidebotham, Norman C.; Shoemaker, Paul D.; and Young, Clarence W., III, 4,118,187, Cl. 8-102.000.

Shono, Tetsuji: *See*—
Kurei, Hiroshi; and Shono, Tetsuji, 4,118,725, Cl. 354-289.000.

Shoupp, William E.; Bratkowski, Walter V.; and Boomgaard, Dirk J., to Westinghouse Electric Corp. Automatic film-exposure control system and electrical power supply means for a photographic camera. 4,118,717, Cl. 354-43.000.

Showa Denko K.K.: *See*—
Ishiguro, Susumu; Komuro, Masuhiro; and Nakamura, Shigeru, 4,118,347, Cl. 521-53.000.

Shpotakovsky, Dmitry Fedorovich: *See*—
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Zjukin, Nikolai Stepanovich; Kostjuk, Boris Dmitrievich; Shaikevich, Stanislava Stanislavovna; Motsak, Yaroslav Feodosievich; Fedulaev, Vitaly Pavlovich; Kolchemanov, Nikolai Alexandrovich; Ugarov, Valentin Mikhailovich; Losev, Viktor Vasilievich; Drui, Mark Simonovich; Lavrinovich, Alla Alexandrovna; Shpotakovsky, Dmitry Fedorovich; and Chizhov, Stanislav Viktorovich, 4,117,968, Cl. 228-124.000.

Shurcliff, William A., to Broad Corporation. Process and apparatus for heat exchange. 4,117,882, Cl. 165-104.00S.

Shwartzman, Stanley; and Mayer, Alfred, to RCA Corporation. Transducer assembly for megasonic cleaning. 4,118,649, Cl. 310-337.000.

Sibley, Henry C.: *See*—
Auer, John H., Jr.; and Sibley, Henry C., 4,118,750, Cl. 361-182.000.

Sidebotham, Norman C.; Shoemaker, Paul D.; and Young, Clarence W., III, to Monsanto Company. Fabric dye stripping, separation and recovery of polyester. 4,118,187, Cl. 8-102.000.

Siekierski, Wladyslaw; and Crane, Richard A., to British Communications Corporation Limited. Electrical circuit arrangements particularly though not exclusively for electrical battery charging systems. 4,118,661, Cl. 320-40.000.

Siemens Aktiengesellschaft: *See*—
Aulich, Hubert; and Grabmaier, Josef, 4,118,212, Cl. 65-3.00A.
Binder, Hans, 4,118,230, Cl. 96-27.00R.
Lange, Gerhard; and Schilling, Gunter, 4,118,682, Cl. 337-34.000.
Mollenhoff, Klaus, 4,118,684, Cl. 337-296.000.
Murrmann, Helmuth; and Wittenzellner, Ernst, 4,118,251, Cl. 148-1.500.
Schlichte, Max, 4,118,697, Cl. 340-347.00C.

Siemens-Elema AB: *See*—
Erikson, Uno Eugen, 4,117,836, Cl. 128-2.05R.

Sig Schweizerische Industrie-Gesellschaft: *See*—
Egli, Alwin, 4,117,649, Cl. 53-558.000.

Silagy, Richard J.: *See*—
Norton, James F.; and Silagy, Richard J., 4,118,006, Cl. 251-149.600.

Silberschlag, Russell Earl, to Borg-Warner Corporation. Wedging centrifugal clutch with torque limiter. 4,117,918, Cl. 192-103.00B.

Silence, William L.: *See*—
Acuncius, Dennis S.; Herchenroeder, Robert Blanchard; Kirchner, Russell W.; and Silence, William L., 4,118,223, Cl. 75-171.000.

Sillion, Bernard: *See*—
Salle, Robert; and Sillion, Bernard, 4,118,392, Cl. 260-326.00N.

Silver, Frank M.; and Bach, Hartwig C., to Monsanto Company. Preparation of oxadiazole copolymer solution from scrap copolymer. 4,118,358, Cl. 260-30.80R.

Simon, Frank N., to Honeywell Inc. Densitometer apparatus. 4,117,716, Cl. 73-32.00A.

Simon, Ned H.: *See*—
Rosey, Richard; Kovatch, George N.; and Simon, Ned H., 4,118,639, Cl. 307-147.000.

Simonsen, John; Gibson, Bruce Douglas; and Gruner, Heinz Walter, to Sybron Corporation. Electric measuring device having a small-bore liquid container with improved electrode sealing means. 4,117,720, Cl. 73-194.0EM.

Simpson, Homer L., to United States of America, Navy. Holographic signature processor. 4,118,685, Cl. 340-146.30P.

Simpson, Robert Emmerson, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Protective clothing. 4,117,552, Cl. 2-2.10A.

Sims, Ruth E. Security system for a building. 4,118,691, Cl. 222-3.000.

Sin, Mikhail Alexandrovich: *See*—
Koshelenko, Gennady Petrovich; Pasynkov, Rafail Moiseevich; Sin, Mikhail Alexandrovich; and Shemper, Leonid Isaakovich, 4,117,770, Cl. 92-57.000.

Singer Company, The: *See*—
Current, Wayne A.; Genge, Bruce I.; Hurme, Herbert J.; and Zocher, Josef, 4,117,791, Cl. 112-222.000.

Singh, Baldev: *See*—
Lesher, George Y.; and Singh, Baldev, 4,118,571, Cl. 544-319.000.

Singh, Shanker: *See*—
Levine, Samuel R.; Singh, Shanker; and Weinberger, Arnold, 4,118,786, Cl. 364-783.000.

Singh, Shri N.: *See*—
Golas, Eugene A.; and Singh, Shri N., 4,117,959, Cl. 222-590.000.

Six, Franz: *See*—
Brabetz, Hartmut; Kemenater, Christof; Six, Franz; and Kaiser, Wilhelm, 4,118,357, Cl. 260-29.6WA.

Sizelove, Cary Leon: *See*—
Dietrich, William John, Sr.; and Sizelove, Cary Leon, 4,117,892, Cl. 172-311.000.

Sjogren, Charles Norman, to Global Marine, Inc. Ice melting system and method. 4,117,794, Cl. 114-40.000.

Skaife, Margaret R.: *See*—
Skaife, William, 4,117,685, Cl. 405-36.000.

Skaife, William, to Skaife, Margaret R. Method and means for irrigating soil and growing plants having varying water requirements. 4,117,685, Cl. 405-36.000.

Skelly, Peter T.: *See*—
Proctor, Darryl F.; Skelly, Peter T.; and Cole, Darrell D., 4,118,597, Cl. 179-18.0FA.

SKF Industries, Inc.: *See*—
Kregler, Helmuth; and Hillmann, Reinhard, 4,118,080, Cl. 308-187.100.

SKF Kugellagerfabriken GmbH: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,118,078, Cl. 308-6.00C.
Schutz, Karl Heinz, 4,117,719, Cl. 73-141.00A.

Skinner, James L.: *See*—
Myers, Gary A.; Abdul-Rahman, Yahia A. K.; and Skinner, James L., 4,118,309, Cl. 208-11.00R.

Skorianetz, Werner; and Ohloff, Gunther, to Firmenich, S.A. Tricyclo[6.2.1.0^{2,7}]undec-9-en-3-one perfume composition. 4,118,343, Cl. 252-522.000.

Skowronski, Michael J.: *See*—
Hipchen, Donald E.; Skowronski, Michael J.; and Hagan, Joseph R., 4,118,533, Cl. 428-297.000.

Slagle, Charles Wilmer: *See*—
Welder, Gerald Elvin; Lang, Edward Russell; and Slagle, Charles Wilmer, 4,118,318, Cl. 210-58.000.

Sleeth, Robert S.: *See*—
Monticelli, Dennis M.; and Sleeth, Robert S., 4,118,621, Cl. 250-214.00A.

Slingerland, Henry H., Jr. Rotatable stand. 4,117,627, Cl. 47-39.000.

Slocombe, Robert J.: *See*—
Fields, Joseph E.; and Slocombe, Robert J., 4,118,554, Cl. 526-15.000.

Slonczewski, John Casimir: *See*—
Argyle, Bernell Edwin; Dekker, Pieter; and Slonczewski, John Casimir, 4,118,793, Cl. 365-30.000.

Slywka, Michael, to Gibson-Homans Company, The. Asbestos delumper. 4,117,982, Cl. 241-51.000.

Small, Marvin: *See*—
Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C., 4,117,958, Cl. 222-402.180.

Smetanjuk, Vladimir Ivanovich: *See*—
Kabanov, Viktor Alexandrovich; Martynova, Marina Alexandrovna; Pluzhnov, Stanislav Konstantinovich; and Smetanjuk, Vladimir Ivanovich, 4,118,432, Cl. 260-683.15D.

Smith, Arnold Ray, to Bell Telephone Laboratories, Incorporated. Apparatus for wiring electrical cabinets. 4,117,585, Cl. 29-566.300.

Smith, Colin: *See*—
Stephenson, Leslie; and Smith, Colin, 4,118,499, Cl. 424-267.000.

Smith, Harry A., to Dow Chemical Company, The. Halogenated diphenyl ether solvents for crystalline polymers. 4,118,363, Cl. 260-33.20R.

Smith, Herman W., to Upjohn Company, The. 5-Oxa-13,14-didehydro-PGF$_1$ compounds. 4,118,416, Cl. 562-503.000.

Smith International, Inc.: *See*—
Ward, Howard; and Tschirky, John, 4,117,895, Cl. 175-53.000.

Smith, John Cambridge: *See*—
Scarfe, Arthur; and Smith, John Cambridge, 4,117,687, Cl. 405-292.000.

Smith, Kenneth E., to Phillips Petroleum Company. 2-For-1 twister equipped with antiwrapping members. 4,117,655, Cl. 57-58.830.

Smith Kline & French Laboratories Limited: *See*—
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,118,496, Cl. 424-263.000.
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,118,502, Cl. 424-273.00R.

Smith, Lawrence S.: *See*—
Paduch, Stanley R.; and Smith, Lawrence S., 4,117,765, Cl. 91-361.000.

Smith, Michael J.: *See*—
Przybyla, Franciszek J.; and Smith, Michael J., 4,118,544, Cl. 429-27.000.

Smith, Otto J. M. Solar collector system. 4,117,682, Cl. 60-641.000.

Smith, Richard W., to X. S. Smith, Inc. Plastic covered gutter connected greenhouse building structure. 4,117,636, Cl. 52-13.000.

Smith, Robert C. Culture and growth system for epiphytic plants. 4,117,628, Cl. 47-59.000.

Smith, Ronald H., to Solergy, Inc. Continuous loop shape memory effect heat engine. 4,117,680, Cl. 60-527.000.

Smith, Sanford Byrom, to Du Pont de Nemours, E. I., and Company.

Solutions of azo dyes derived from 4-4-diamino-2,2-stilbenedisulfonic acid. 4,118,182, Cl. 8-7.000.

Smith, Walton J. High vacuum freeze-drying. 4,117,603, Cl. 34-5.000.

SmithKline Corporation: *See—*
Berges, David A., 4,118,490, Cl. 424-246.000.
Berges, David A., 4,118,491, Cl. 424-246.000.
Brenner, L. Martin; and Loev, Bernard, 4,118,567, Cl. 544-131.000.

Smorzaniuk, Adam: *See—*
O'Neil, Charles P.; Smorzaniuk, Adam; and Young, James O., 4,118,005, Cl. 251-75.000.

Snow Brand Milk Products Co. Ltd.: *See—*
Niki, Hiroshi; Deya, Eiki; Doi, Toru; Igarashi, Seiichiro; and Hayashi, Hiromichi, 4,118,517, Cl. 426-271.000.

Snyder, John M., to Snyder, John M.; Steinberg, Bernard J.; and Halle, Edward. Slidable suitcase handle. 4,117,914, Cl. 190-58.00R.

Societa Anonima Castelli s.a.s. Di C. Castelli & C.: *See—*
Piretti, Giancarlo, 4,117,784, Cl. 108-150.000.

Societe Anonyme D.B.A.: *See—*
Carre, Jean-Jacques, 4,118,077, Cl. 303-6.00C.
Kervagoret, Gilbert, 4,117,766, Cl. 91-457.000.

Societe Anonyme Francaise du Ferodo: *See—*
Neveux, Rene Elie, 4,118,053, Cl. 280-747.000.

Societe Chauvin Arnoux: *See—*
Arnoux, Daniel, 4,118,787, Cl. 364-842.000.

Societe Coil Protection Service: *See—*
Nakache, Robert; and Lequeux, Christian, 4,117,704, Cl. 72-83.000.

Societe d'Assistance Technique pour Produits Nestle, S.A.: *See—*
Cazenave, Paul, 4,118,521, Cl. 426-651.000.

Societe de Recherches et de Promotion d'Activities Nouvelles Acno: *See—*
Tavernier, Jean; and Henaut, Eugene, 4,117,599, Cl. 33-77.000.

Societe de Vente de l'Aluminium Pechiney: *See—*
Cimetiere, Louis; and Gonda, Richard, 4,117,880, Cl. 164-433.000.

Societe Generale de Constructions Electriques et Mecaniques Alsthom: *See—*
Gillet, Roger; and Allegre, Jean, 4,118,648, Cl. 310-269.000.

Societe Hure S.A.: *See—*
Sachot, Michel E., 4,117,762, Cl. 90-11.00F.

Societe Lignes Telegraphiques et Telephoniques: *See—*
Arnaud, Maurice, 4,118,594, Cl. 350-96.230.

Societe Nationale Elf Aquitaine (Production): *See—*
Fournie, Rene, 4,117,693, Cl. 405-171.000.

Sokolow, Nickolas N., to Beloit Corporation. Multi-port valved nozzle for co-injection molding. 4,117,955, Cl. 222-144.500.

Solergy, Inc.: *See—*
Smith, Ronald H., 4,117,680, Cl. 60-527.000.

Solt, Paul E., to Fuller Company. Pulsed air activated conveyor and system. 4,118,074, Cl. 302-26.000.

Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, to Sankyo Company Limited. Synthetic polymer stabilizers. 4,118,368, Cl. 260-45.80N.

Sony Corporation: *See—*
Okada, Hitoshi; and Naruse, Yohsuke, 4,118,736, Cl. 358-128.000.

Sorter, James A.: *See—*
Wilburn, Everett R.; and Sorter, James A., 4,117,774, Cl. 99-568.000.

Souriau & Cie: *See—*
Obeissart, Albert, 4,118,093, Cl. 339-75.00M.

Spacek, Karel: *See—*
Johansson, Jan-Olof; Korpela, Heikki; and Spacek, Karel, 4,117,754, Cl. 83-307.200.

Speakman Company: *See—*
Lagarelli, Carmen J.; and Rudewick, Charles J., 4,117,979, Cl. 239-381.000.

Specht, Paul B., to International Telephone and Telegraph Corporation. Vented window assembly for automotive vehicles. 4,117,772, Cl. 98-2.000.

Specht, Steven J., to Olin Corporation. Method of renewing a porous diaphragm having reduced permeability to alkali metal chloride brines. 4,118,308, Cl. 204-296.000.

Spence-Bate, Harry Arthur Hele; and Wilson, Michael Edwin, to Spence-Bate, Harry Arthur Hele. Editors for microfiche cameras. 4,118,123, Cl. 355-78.000.

Sperry Rand Corporation: *See—*
Olsen, James A.; Butler, Gene R.; and Sesser, George L., 4,117,942, Cl. 214-6.00B.

Spies, Johann; and Wohrl, Alfons, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Sensor system for releasing passive safety apparatus in car crashes. 4,117,730, Cl. 73-517.00R.

Spiralux Limited: *See—*
Fluester, James, 4,117,710, Cl. 72-391.000.

Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C. Vapor tap valve for aerosol containers used with flammable propellants. 4,117,958, Cl. 222-402.180.

Spohn, Daniel M., Jr. Attachment for a rotary drive machine. 4,118,141, Cl. 408-90.000.

Spranger, Douglas M.; Brookes, Malcolm J.; and Mulhauser, Paul J., to Seiko Time Corporation. Wheeled sample case. 4,118,048, Cl. 280-47.350.

Spray, Claude. Floating offshore drilling platform. 4,117,691, Cl. 405-205.000.

Springer, Hartmut: *See—*
Feess, Erich; Springer, Hartmut; and Gronen, Willy, 4,118,186, Cl. 8-49.000.

Squitieri, Vincent: *See—*
Kuist, Charles H.; Squitieri, Vincent; and Seeger, Richard E., 4,118,102, Cl. 339-17.00F.

Stabilus GmbH: *See—*
Schnitzius, Klaus, 4,118,131, Cl. 403-24.000.

Stach, Heinrich: *See—*
Hodzic, Alija; Haferkamp, Dirk; Stach, Heinrich; and Paetz, Eike, 4,118,276, Cl. 176-60.000.

Stach, Leonard J.: *See—*
Hotz, Roger D.; Stach, Leonard J.; and Richter, Sidney B., 4,118,216, Cl. 71-88.000.

Stahl, Karl Erik. Loudspeaker lower bass response using negative resistance and impedance loading. 4,118,600, Cl. 179-1.00D.

Stahl, William F., to Westinghouse Electric Corp. Water-cooled turbine blade. 4,118,145, Cl. 416-96.00R.

Standard Oil Company (Indiana): *See—*
Honaker, Donald E., 4,117,886, Cl. 166-259.000.

Stanley, Harry Eugene, to Du Pont de Nemours, E. I., and Company. Crimped bicomponent-filament yarn with randomly reversing helical filament twist. 4,118,534, Cl. 428-370.000.

Stannow, Jorgen Christian; Kjeldsen, Kjeld; Tankred, Hans Jurgen; and Madsen, Per Johan, to Danfoss A/S. Encapsulated motor compressor for refrigerators. 4,118,153, Cl. 417-363.000.

Staples, John L.: *See—*
Charles, Ronald A.; Jones, Paul W.; Staples, John L.; and Wiegner, Joseph R., 4,118,280, Cl. 195-127.000.

Star Seimitsu Kabushiki Kaisha: *See—*
Matsuura, Haruo; and Kawahara, Kiyoshi, 4,118,745, Cl. 360-96.000.

Stark, Josef: *See—*
Bonacker, Ludwig; and Stark, Josef, 4,118,349, Cl. 260-8.000.

Starr, Carrol Dean: *See—*
Wang, Teh Po; and Starr, Carrol Dean, 4,118,224, Cl. 75-171.000.

Stauffer Chemical Company: *See—*
Fancher, Llewellyn, 4,118,576, Cl. 560-29.000.
Jin, Jung Il; and Kraft, Paul, 4,118,440, Cl. 260-873.000.
Via, Francis A., 4,118,298, Cl. 204-159.230.

Stauffer, Eric. Release device fo deadfall traps. 4,117,620, Cl. 43-77.000.

Stauner, Thomas: *See—*
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,118,232, Cl. 96-99.000.

Steckelberg, Willi; Panke, Hans Ludwig; May, Adolf; and Bucking, Hans-Walter, to Hoechst Aktiengesellschaft. Fabric softeners. 4,118,324, Cl. 252-8.900.

Steel City Corporation, The: *See—*
Fibus, C. Kenneth, 4,118,085, Cl. 312-245.000.

Steel, Robert R.: *See—*
Nickerson, James H. D.; and Steel, Robert R., 4,117,885, Cl. 165-176.000.

Steele, Robert L.: *See—*
Braund, Darwin G.; Dolge, Kendall L.; Goings, Richard L.; and Steele, Robert L., 4,118,513, Cl. 426-2.000.

Steenson, Thomas William; and Paton, W. Donald, to Butler Manufacturing Company. Reinforced insulated concrete building panel. 4,117,639, Cl. 52-223.00R.

Stein, Philip C. Permanent automatic rotor balancer for shafts operating above critical speed. 4,117,742, Cl. 74-573.00R.

Steinberg, Bernard J.: *See—*
Snyder, John M., 4,117,914, Cl. 190-58.00R.

Stelben, John J.: *See—*
Calvi, Salvatore J.; and Stelben, John J., 4,118,178, Cl. 432-35.000.

Stellmach, Bruno. Method and device for the coating of tablets. 4,118,522, Cl. 427-3.000.

Stephenson, Leslie; and Smith, Colin, to Glaxo Laboratories Limited. Anti-anxiety and anti-parkinsonian 1-aminoalkyl-2-endo-chloro-7,7-dimethylnorbornanes. 4,118,499, Cl. 424-267.000.

Sterling Drug Inc.: *See—*
Lesher, George Y., 4,118,557, Cl. 542-420.000.
Lesher, George Y.; and Singh, Baldev, 4,118,571, Cl. 544-319.000.

Stevenson, Curtis A. Spring tie fishing sinker. 4,117,619, Cl. 43-43.100.

Stillman, Neil W.: *See—*
Kidon, William E.; and Stillman, Neil W., 4,117,560, Cl. 4-321.000.

Stoddart, Hugh F.: *See—*
Richardson, Carl; Stoddart, Hugh F.; and Wiley, Philip A., 4,117,935, Cl. 209-586.000.

Stoelker, Charles V.: *See—*
Williams, Glenn L., 4,118,480, Cl. 424-131.000.

Stork Brabant B.V.: *See—*
Vertegaal, Jacobus Gerardus, 4,117,779, Cl. 101-120.000.

Stots & Co. AG: *See—*
Koula, Zdenek; Nirk, Peter; and Wullschleger, Hans, 4,117,799, Cl. 118-6.000.

Strain, Patrick J. Double sectioned tank. 4,117,796, Cl. 114-74.00R.

Stransky, Werner Theo: *See—*
Bestmann, Hans Jurgen; Stransky, Werner Theo; and Vostrowsky, Otto, 4,118,406, Cl. 260-410.90R.

Stratton, Richard O.: *See—*
Benedyk, Joseph C.; and Stratton, Richard O., 4,118,530, Cl. 428-92.000.

Strayer, Roy E., Jr., to United States of America, Army. r.f. Network antenna analyzer employing sampling techniques and having remotely located sampling probes. 4,118,668, Cl. 325-67.000.

Strecker, Helmut; Kasmarker, Reinhard; and Kloss, Gerhard, to Hoechst Aktiengesellschaft. Technetium-99m-labelled diagnostic agent for kidney scanning and process for its manufacture. 4,118,468, Cl. 424-1.000.

Streinstrasser, Ralf: *See—*
Krause, Joachim; Streinstrasser, Ralf; Pohl, Ludwig; Del Pino, Fernando; and Weber, Georg, 4,118,335, Cl. 252-299.000.
Strickroth, Erich: *See—*
Schabert, Hans-Peter; Bremer, Hans; and Strickroth, Erich, 4,118,277, Cl. 176-87.000.
Stroh, Thomas L.: *See—*
Lund, Arnold S.; and Stroh, Thomas L., 4,118,167, Cl. 425-463.000.
Stromberger-D'Alton-Rauch, Ilse-Dore; Klose, Karl; Bergmann, Udo; Glattli, Alfred; and Hodum, Claus-Peter, to U.S. Philips Corporation. High energy recording on an acetyl acetonate. 4,118,229, Cl. 96-27.00H.
Strub, Fritz, to Filtrox Maschinenbau A.G. Method of and an apparatus for controlling the quantity of filter aid fed to a sedimentation filter in a given unit of time during filtration. 4,118,778, Cl. 364-502.000.
Structural Rubber Products Company: *See—*
Whitlock, Jacob O., 4,117,977, Cl. 238-8.000.
Struger, Odo J.; McAdams, Timothy E.; and Dummermuth, Ernst, to Allen-Bradley Company. Malfunction detection system for a microprocessor based programmable controller. 4,118,792, Cl. 364-900.000.
Struger, Odo J.: *See—*
Casto, Walter V.; DeLong, Lawrence W.; Markley, Theodore J.; and Struger, Odo J., 4,118,789, Cl. 364-900.000.
Stuart, Fred E. Method and apparatus for agitating and scrubbing filter bed. 4,118,320, Cl. 210-80.000.
Stuever, George W.: *See—*
Becker, Donald E.; Achenbach, Gary D.; and Stuever, George W., 4,118,325, Cl. 252-8.100.
Sudo, Tadamitsu: *See—*
Sawai, Masanobu; Sudo, Tadamitsu; and Enomoto, Shogo, 4,118,192, Cl. 424-12.000.
Sugimoto, Sachirou; and Katsuki, Kanji, to Mitsubishi Denki Kabushiki Kaisha. Inverter apparatus commutated by an auxiliary source. 4,118,770, Cl. 363-138.000.
Sugita, Terumitsu; and Tateishi, Yasuo, to Seiko Seiki Kabushiki Kaisha. Controlling method for a grinding machine. 4,117,634, Cl. 51-281.00R.
Sugiyama, Masaaki; Yuda, Takuo; and Mizusawa, Akira, to Yamakawa Industry Co. Ltd.; and Nifco, Inc. Strainer. 4,118,323, Cl. 210-439.000.
Suling, Carlhans: *See—*
Konig, Joachim; and Suling, Carlhans, 4,118,556, Cl. 526-229.000.
Lindner, Christian; Suling, Carlhans; Arend, Gunter; Brokmeier, Dieter; and Nischk, Gunther, 4,118,375, Cl. 526-240.000.
Sullivan, James P.: *See—*
Eckel, Leonard B.; Sullivan, James P.; and Quintana, Elias D., 4,117,783, Cl. 108-91.000.
Sulzer Brothers Limited: *See—*
Burer, Franz, 4,117,871, Cl. 139-429.000.
Christ, Alfred; Lehmann, Helmut; Kantor, Ludwig; and Miller, Helmut, 4,118,040, Cl. 277-75.000.
Ivosevic, Strahinja, 4,118,156, Cl. 417-494.000.
Sumitomo Bakelite Company Limited: *See—*
Miki, Kyosuke; and Takeuchi, Masahiro, 4,118,454, Cl. 264-93.000.
Sumitomo Chemical Company, Limited: *See—*
Kitamura, Shigeyoshi; Itaya, Nobushige; Okuno, Yoshitoshi; Ohno, Nobuo; Matsuo, Takashi; Hirano, Masachika; Mizutani, Toshio; and Takeda, Hisami, 4,118,505, Cl. 424-275.000.
Yamazaki, Noboru; and Higashi, Fukuji, 4,118,374, Cl. 528-337.000.
Summers, Robert Milton, to Bendix Corporation, The. Phenolic resin recovery process. 4,118,346, Cl. 260-2.300.
Sundstrand Corporation: *See—*
Glennon, Timothy F., 4,118,688, Cl. 340-516.000.
Sunpak Corporation: *See—*
Tsuruta, Yuzo, 4,118,715, Cl. 354-33.000.
Surgical Design Corp.: *See—*
Banko, Anton, 4,117,843, Cl. 128-230.000.
Sussman, Howard. Stackable compartmentalized structure for cosmetics or the like. 4,118,084, Cl. 312-107.000.
Sutter, Hans Rudolf: *See—*
Mosimann, Peter Hubert; and Sutter, Hans Rudolf, 4,117,663, Cl. 58-85.500.
Sutton, Jerry L.: *See—*
Allen, Royce H.; Sutton, Jerry L.; Griffin, Dan M.; Frye, Hal W.; and Colborn, Joseph G., 4,118,782, Cl. 364-565.000.
Suzuki, Hideo; Sato, Takahisa; Kubota, Tatsuo; Osaka, Shigemi; and Komatsu, Shigeru, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Preparation of maleic anhydride. 4,118,402, Cl. 260-346.750.
Suzuki, Kazuie; Torimaru, Takashi; and Akiyama, Chuji, to Hokushin Electric Works, Ltd. Magnetic flowmeter. 4,117,721, Cl. 73-194.0EM.
Suzuki, Masayuki; Sakurada, Nobuaki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyashu, to Canon Kabushiki Kaisha. Photographic mode selection device for a camera. 4,118,716, Cl. 354-38.000.
Suzuki, Tetsuro; Oishi, Masaaki; and Ashida, Itaru, to Kabushiki Kaisha Seikosha. Device for retaining two alternate positions. 4,117,743, Cl. 74-577.00M.
Swain, Richard Slaughter, to Norlin Music, Inc. Multi-level encoding system. 4,118,791, Cl. 364-900.000.
Swenson, Alan F.: *See—*
Rovin, Herman; Levine, Lawrence J.; Opuszenski, Theodore; Pellicano, Joseph; and Swenson, Alan F., 4,117,789, Cl. 112-181.000.
Swift, James L., to American District Telegraph Corporation. Connector for reed switches. 4,118,098, Cl. 339-263.00R.
Sybron Corporation: *See—*
Simonsen, John; Gibson, Bruce Douglas; and Gruner, Heinz Walter, 4,117,720, Cl. 73-194.0EM.
Tackett, Louis Eugene, to UNEP3 Energy Systems Inc. Integrated energy system. 4,118,637, Cl. 290-55.000.
Tadokoro, Tomoo, to Toyo Kogyo Co., Ltd. Engine and reactor connection system. 4,117,674, Cl. 60-282.000.
Taguchi, Shinichiro: *See—*
Gomi, Hiroshi; and Taguchi, Shinichiro, 4,118,741, Cl. 358-28.000.
Tahara, Kazutoki: *See—*
Sado, Ryoichi; and Tahara, Kazutoki, 4,118,092, Cl. 339-59.00M.
Taig, Alistair Gordon, to Bendix Corporation, The. Power steering control valve. 4,117,864, Cl. 137-625.230.
Takabatake, Mitsuo, to Asahi Glass Company Ltd. Aluminum titanate composition being stable at high temperature. 4,118,240, Cl. 106-73.330.
Takacs, Joseph E.: *See—*
Takacs, Victor C.; and Takacs, Joseph E., 4,118,138, Cl. 407-112.000.
Takacs, Victor C.; and Takacs, Joseph E., to Triangle Grinding, Inc. Cutting tool. 4,118,138, Cl. 407-112.000.
Takada, Keisuke, to Tokyo Shibaura Electric Co., Ltd. Digital controller system. 4,118,772, Cl. 364-119.000.
Takahashi, Akira, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Intake regulator for internal combustion engine. 4,117,814, Cl. 123-119.00A.
Takahashi, Toru, to Yamaichi Electric Mfg. Co., Ltd. Connecting means for flexible flat cable connector. 4,118,096, Cl. 339-99.00R.
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, to Riken Keikinzoku Kogyo Kabushiki Kaisha. Apparatus for manufacturing extruded structural profiles from aluminum based metal scraps. 4,117,703, Cl. 72-38.000.
Takahashi, Yoshio: *See—*
Ohtsuki, Nobuo; Hayashi, Toshio; Imai, Akio; Takahashi, Yoshio; and Hashimoto, Noboru, 4,118,660, Cl. 318-571.000.
Takamiya, Bonnosuke, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Gas injection system for internal combustion engine. 4,117,808, Cl. 123-75.00B.
Takeda, Hisami: *See—*
Kitamura, Shigeyoshi; Itaya, Nobushige; Okuno, Yoshitoshi; Ohno, Nobuo; Matsuo, Takashi; Hirano, Masachika; Mizutani, Toshio; and Takeda, Hisami, 4,118,505, Cl. 424-275.000.
Takeda, Kunihiko: *See—*
Seko, Maomi; Miyake, Tetsuya; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, 4,118,457, Cl. 423-7.000.
Takeshita, Hiroshi, to Kabushiki Kaisha Suwa Seikosha. Display cell. 4,117,659, Cl. 58-23.00R.
Takeuchi, Akitoshi: *See—*
Fukuda, Yoshiharu; Ohtani, Kazumasa; Onissi, Tossio R.; and Takeuchi, Akitoshi, 4,118,196, Cl. 422-232.000.
Takeuchi, Masahiro: *See—*
Miki, Kyosuke; and Takeuchi, Masahiro, 4,118,454, Cl. 264-93.000.
Talley, Charles P.; Bradley, Guy M.; and Guliana, Ronald T., to Calgon Corporation. Quaternized siliceous supports for gel permeation chromatography. 4,118,316, Cl. 210-31.00C.
Tamaki, Nobuo: *See—*
Shiohara, Tomoo; Miyamoto, Minoru; and Tamaki, Nobuo, 4,118,227, Cl. 106-306.000.
Tanaka, Akira, to American Safety Equipment Corporation. Inertia-responsive vehicle seat back latch mechanism. 4,118,067, Cl. 297-379.000.
Tanaka, Minoru; Kajitani, Ikuo; and Nagase, Hidenobu, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust purifying system for internal combustion engines. 4,117,675, Cl. 60-302.000.
Tanei, Fumio; and Ikeda, Toshiaki, to Horiba, Ltd. Apparatus and process for determination of oil content in deballasting water and wash water discharged from a tanker. 4,118,779, Cl. 364-509.000.
Taninaka, Kuniaki; Kurono, Hitoshi; and Kasai, Tsutomu, to Nihon Nohyaku Co., Ltd. Pharmaceutical compositions containing 1,3-dithiol-2-ylidene malonate derivatives. 4,118,506, Cl. 424-277.000.
Tankred, Hans Jurgen: *See—*
Stannow, Jorgen Christian; Kjeldsen, Kjeld; Tankred, Hans Jurgen; and Madsen, Per Johan, 4,118,153, Cl. 417-363.000.
Tanner, Lee E., to Allied Chemical Corporation. Glassy hafnium-beryllium alloys. 4,118,222, Cl. 75-134.00V.
Tanner, Willi. Segmented band. 4,117,667, Cl. 59-80.000.
Tanoshima, Katsuhide: *See—*
Watanabe, Akinori; Tanoshima, Katsuhide; Noguchi, Matsusaburo; and Hattori, Kinya, 4,117,778, Cl. 101-1.000.
Tarpley, William B., Jr., to Energy and Minerals Research Co. Ultrasonic emulsifier and method. 4,118,797, Cl. 366-127.000.
Tarver, Samuel Allen, Jr. Spreading device for drum mowers. 4,117,653, Cl. 56-13.600.
Tarynin, Evgeny Konstantinovich: *See—*
Burin, Viktor Leontievich; Tjutjunnikov, Anatoly Borisovich; Golosov, Viktor Nikolaevich; Tarynin, Evgeny Konstantinovich; Pogorely, Nikolai Pavlovich; and Lukyanenko, Vladimir Matveevich, 4,118,446, Cl. 261-114.0VT.
Tasseff, John B., II: *See—*
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Tateishi, Yasuo: *See—*
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Tavernier, Jean; and Henaut, Eugene, to Societe de Recherches et de

Promotion d'Activities Nouvelles Acno. Apparatus for drafting inaccurate conic perspective. 4,117,599, Cl. 33-77.000.
Taylor, Jeffrey Philip: *See—*
Cockett, Stewart Graham; Taylor, Jeffrey Philip; Craven, Peter; and Farmer, Alan Charles, 4,118,790, Cl. 364-900.000.
TCM Corporation: *See—*
Middleton, Charles A.; and Middleton, Trudy B., 4,117,781, Cl. 108-11.000.
TDK Electronics Co., Ltd.: *See—*
Goshima, Yoshio; and Osada, Hisashi, 4,118,678, Cl. 333-70.00S.
Ishino, Ken; Yamashita, Hiroshi; Ono, Nobuyuki; and Hashimoto, Yasuo, 4,118,704, Cl. 343-18.00A.
Technical Operations, Incorporated: *See—*
Parrent, George B., Jr.; and Ward, John H., 4,118,107, Cl. 350-162.0SF.
Teledyne Industries, Inc.: *See—*
Isley, Walter F., 4,117,717, Cl. 73-38.000.
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Levy, Julienne, 4,117,913, Cl. 90-15.100.
Tellier, James G.: *See—*
Trist, Nicolas P.; Guffin, Robert E.; Franklin, Walter M.; Crosby, James B., Jr.; Hallaway, Glen N.; and Tellier, James G., 4,117,597, Cl. 32-27.000.
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Terada, Sadatugu: *See—*
Mayama, Masayoshi; Terada, Sadatugu; Muramatsu, Toshio; Kimura, Masayuki; Ishibara, Masao; and Kobayashi, Tohru, 4,118,231, Cl. 96-87.00A.
Teramachi, Hiroshi. Double slide way bearing including recirculating ball bearings. 4,118,101, Cl. 308-6.00C.
Terjung, Klaus: *See—*
Gruner, Hans; Terjung, Klaus; Sachse, Wolfgang; and Romerswinkel, Heinrich-Wilhelm, 4,118,018, Cl. 266-275.000.
Terni Societa per l'Industria e'Elettricita S.p.A.: *See—*
Barisoni, Mario; Barteri, Massimo; Ricci-Bitti, Roberto; Marianeschi, Edmondo G. A.; Basevi, Sandro C.; Borgianni, Carlo; and Santafe, Carlo, 4,118,255, Cl. 148-111.000.
Terral, Leonard G.: *See—*
Regelson, Ephraim; Terral, Leonard G.; Matusiak, Ronald J.; Trotter, Jerry L.; Rea, William L.; and Mangel, Edward L., 4,117,967, Cl. 228-20.000.
Terry, Catherine S. Nail clipper with trim retaining clamp. 4,117,591, Cl. 30-124.000.
Texaco Development Corp.: *See—*
Burns, Simon Pierce; and Walton, John Monte, 4,118,286, Cl. 203-89.000.
Klein, Howard P., 4,118,422, Cl. 260-561.00A.
Texaco Inc.: *See—*
Herbstman, Sheldon, 4,118,425, Cl. 260-614.00A.
Texas Alkyls, Inc.: *See—*
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Texas Instruments Incorporated: *See—*
Doherty, John, Jr., 4,117,976, Cl. 236-48.00R.
Frye, Robert Charles; Katz, Alan Harry; and Hewes, Charles Robert, 4,118,795, Cl. 365-222.000.
Scott, Warner Curtis, 4,118,650, Cl. 313-422.000.
Scott, Warner Curtis, 4,118,651, Cl. 313-422.000.
Textron Inc.: *See—*
Arbuckle, James A., 4,117,594, Cl. 30-381.000.
Chmura, William J., 4,118,009, Cl. 251-315.000.
Th. Goldschmidt AG: *See—*
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Tham, Wing Chong: *See—*
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Thermo King Corporation: *See—*
Howland, Leland L., 4,117,740, Cl. 74-469.000.
Thillays, Jacques Claude: *See—*
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Thomas-Barben Instruments: *See—*
Barben, Theodore R., II, 4,118,663, Cl. 324-30.00R.
Thomas, Colin Arthur: *See—*
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Thomas J. Lipton, Inc.: *See—*
Visser, Johannes; Oosthoek, Raoul Henricus Josephus; Groeneweg, Jan Willem; and Dijkstra, Hendrik, 4,118,520, Cl. 426-574.000.
Thornburg, David D., to Xerox Corporation. Method for reducing power dissipation in tapered resistor devices. 4,118,112, Cl. 350-351.000.
Tiemens, Ulf: *See—*
Weiss, Hermann; Klotz, Erhard; and Tiemens, Ulf, 4,118,099, Cl. 350-3.730.
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Tjutjunnikov, Anatoly Borisovich: *See—*
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Toa Oil Co., Ltd.: *See—*
Sano, Masaru; and Kashima, Koji, 4,118,467, Cl. 423-573.00R.
Todokoro, Masatoshi. Game board for children. 4,118,026, Cl. 273-1.00R.
Todt, William H.: *See—*
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Tokico Ltd.: *See—*
Murakami, Takao; Ishikawa, Yasuo; and Ito, Masahiro, 4,118,151, Cl. 417-223.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Gomi, Hiroshi; and Taguchi, Shinichiro, 4,118,741, Cl. 358-28.000.
Takada, Keisuke, 4,118,772, Cl. 364-119.000.
Yoshida, Takashi; and Kobayashi, Kenzo, 4,118,707, Cl. 343-765.000.
Tolley, William K., to UOP Inc. Production of titanium metal values, 4,119,696, Cl. 423-53.
Tolmie, Robert J., Jr.: *See—*
Carvalko, Joseph R.; and Tolmie, Robert J., Jr., 4,118,634, Cl. 250-577.000.
Tomco, Inc.: *See—*
Qureshi, Azam S., 4,117,862, Cl. 137-596.130.
Tomita, Satoru; Ohori, Tamio; Karasawa, Shuichi; and Ohta, Wasaburo, to Ricoh Company, Ltd. Electrostatic printing apparatus comprising improved printing electrode head. 4,118,710, Cl. 346-153.000.
Tommasini, Raffaele: *See—*
Giraldi, PierNicola; Nannini, Giuliano; Logemann, Willy; Tommasini, Raffaele; Buttinoni, Ada; and Biasoli, Giovanni, 4,118,504, Cl. 424-274.000.
Topliffe, Roger O., to Sanders Associates, Inc. Inertial measurement device. 4,117,729, Cl. 73-516.0LM.
Topol, Leo E.: *See—*
Raleigh, Douglas O.; and Topol, Leo E., 4,118,194, Cl. 422-98.000.
Torimaru, Takashi: *See—*
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Toyo Boseki Kabushiki Kaisha: *See—*
Matsui, Takeshi; and Arakawa, Kunihiko, 4,118,438, Cl. 260-857.00L.
Toyo Jozo Company, Ltd.: *See—*
Morishita, Masataka; Yokokawa, Yasuo; Nishikawa, Tokio; Mishiro, Masahiro; Ohashi, Shigeyasu; Fukushima, Mitsuru; Inaba, Yoshihito; and Matsuda, Tetsuo, 4,118,336, Cl. 252-316.000.
Toyo Kogyo Co., Ltd.: *See—*
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Toyo Soda Manufacturing Co., Ltd.: *See—*
Miyanohara, Isao; Miyazaki, Hiroshi; and Kawamura, Hideo, 4,118,319, Cl. 210-51.000.
Toyota Jidosha Kogyo K.K.: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Trayanov, Svetozar Paissiev: *See—*
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TRE Corporation: *See—*
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Trefimetaux: *See—*
Moreau, Marc, 4,118,617, Cl. 219-10.61R.
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Kasubke, Dietmar; and Trefz, Wilhelm, 4,118,130, Cl. 401-2.000.
Trenkle, Eckhart. Astrological device. 4,117,608, Cl. 35-44.000.
Trepo, Christian: *See—*
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, 4,118,478, Cl. 424-89.000.
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, 4,118,479, Cl. 424-89.000.
Triangle Grinding, Inc.: *See—*
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Tribble, John: *See—*
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Trist, Nicolas P.; Guffin, Robert E.; Franklin, Walter M.; Crosby, James B., Jr.; Hallaway, Glen N.; and Tellier, James G., to L.A. Gauge Co. Inc. Dental drill. 4,117,597, Cl. 32-27.000.
Triumph Werke Nurnberg A.G.: *See—*
Meier, Heinz; Zurawski, Egon; and Greppmaier, Paul, 4,117,739, Cl. 74-404.000.
Trotter, Jerry L.: *See—*
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Truscheit, Ernst: *See—*
Schnabel, Eugen; Schlumberger, Horst Dieter; Reinhardt, Gerd; Truscheit, Ernst; and Tschesche, Harald, 4,118,481, Cl. 424-177.000.
TRW Inc.: *See—*
Frisby, Reg Alan, 4,118,091, Cl. 339-14.00R.
Key, Edward H., 4,118,094, Cl. 339-75.0MP.

Tschesche, Harald: *See—*
Schnabel, Eugen; Schlumberger, Horst Dieter; Reinhardt, Gerd; Truscheit, Ernst; and Tschesche, Harald, 4,118,481, Cl. 424-177.000.
Tschirky, John: *See—*
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Tschopp, Paul: *See—*
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,118,232, Cl. 96-99.000.
Tsunoda, Takahiro; and Yamaoka, Tsuguo, to Murakami Screen Kabushiki Kaisha. Photosensitive composition for printing screens. 4,118,233, Cl. 96-115.00P.
Tsuruoka, Koichi: *See—*
Ogawa, Toshiya; Niki, Akio; Uchimura, Kazuo; and Tsuruoka, Koichi, 4,118,695, Cl. 340-324.0AD.
Tsuruta, Yuzo, to Sunpak Corporation. Electronic photoflash having a terminal board. 4,118,715, Cl. 354-33.000.
Tull, Steven L. Potted plant watering means. 4,117,631, Cl. 47-81.000.
Tunesi, Roger. Device for the fixing of a beam to the chassis of a touring caravan. 4,118,049, Cl. 280-483.000.
Turbak, Albin F.; Thelman, John P.; and Auerbach, Andrew B., to International Telephone and Telegraph Corporation. Cellulose acetate solutions containing methylolated polymers. 4,118,350, Cl. 260-15.000.
Turbo, S.A.: *See—*
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Turk, Chester F.; and Krapcho, John, to E. R. Squibb & Sons, Inc. 2-Aryl-6-arylidene-1-(substituted aminoalkoxy)-1-cyclohexenes. 4,118,558, Cl. 542-429.000.
Turner Electric Corporation: *See—*
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Turner, John L.; and Diener, Fred L., to Turner Electric Corporation. Self-contained hydraulic switch operator. 4,117,678, Cl. 60-369.000.
Turner, Robert Bruce; and Weinberg, Glen Lee, to Johnson & Johnson. Probe cover. 4,117,926, Cl. 206-306.000.
Tyler Refrigeration Corporation: *See—*
Myers, James E.; and Kennedy, Tom E., 4,117,697, Cl. 62-256.000.
Tyler, William E., III: *See—*
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U-Haul International, Inc.: *See—*
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Uchida, Yoshiro; Mizuno, Toshihiko; Higuchi, Isao; Imai, Susumu; and Usui, Shyoichiro, to Hitachi Seiki Co., Ltd. Machine tool with automatic tool changer. 4,117,586, Cl. 29-568.000.
Uchimura, Kazuo: *See—*
Ogawa, Toshiya; Niki, Akio; Uchimura, Kazuo; and Tsuruoka, Koichi, 4,118,695, Cl. 340-324.0AD.
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, to Minolta Camera Kabushiki Kaisha. Camera with selector for either electromagnetic release or mechanical release. 4,118,724, Cl. 354-266.000.
Ueda, Hiroshi: *See—*
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Uesugi, Kyozo: *See—*
Kuramoto, Yoshio; Ueda, Hiroshi; and Uesugi, Kyozo, 4,118,726, Cl. 354-289.000.
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Uhlig, Albert R.: *See—*
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Ultrasona AG: *See—*
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Umehara, Kunio, to Hitachi, Ltd. Switching regulator for television receiver for generating a stabilized D.C. supply voltage for operating the various TV circuits. 4,118,739, Cl. 358-190.000.
Unarco Industries, Inc.: *See—*
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Underwood, Willie Bruce, to Dynatech Laboratories Incorporated. Nephelometer having pulsed energy source. 4,118,625, Cl. 250-343.000.
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Union Carbide Corporation: *See—*
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Union Special Corporation: *See—*
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
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United Merchants and Manufacturers, Inc.: *See—*
Gregorian, Razmic S.; and Namboodri, Chettoor G., 4,118,526, Cl. 427-350.000.
United States of America
Army: *See—*
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Hafner, Erich, 4,118,673, Cl. 331-2.000.
Kerr, John L., 4,118,706, Cl. 343-700.0MS.
Laplante, Paul R., 4,118,727, Cl. 357-10.000.
Rabinow, Jacob, 4,118,702, Cl. 343-7.0PF.
Redman, Charles M., 4,118,676, Cl. 332-7.510.
Schertz, Charles J.; and Wilson, Dennis L., 4,117,760, Cl. 89-33.00C.
Strayer, Roy E., Jr., 4,118,668, Cl. 325-67.000.
Energy: *See—*
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Booth, Rex, 4,118,042, Cl. 277-226.000.
Carleton, Richard D.; and Bhattacharyya, Ajay, 4,118,275, Cl. 176-36.00R.
Graven, Robert M.; Gorski, Anthony J.; Schertz, William W.; and Graae, Johan E. A., 4,118,249, Cl. 136-89.0PC.
Green, Sheryll C.; and Linse, Vonne D., 4,117,966, Cl. 228-2.500.
Porter, Gary D.; and Bogdanoff, Anatoly, 4,118,627, Cl. 250-397.000.
Rinde, James A., 4,118,449, Cl. 264-28.000.
Ryan, Michael J., 4,118,057, Cl. 292-307.00R.
Wampole, Nevin C., 4,118,278, Cl. 176-87.000.
National Aeronautics and Space Administration; acting administrator; with respect to an invention of:
Wall, William A., Jr.; Ives, Robert E.; Bruce, Miles Melvin, Jr.; Pryor, Peter Paul, Jr.; and Gard, Leslie H. Computerized system for translating a torch head. 4,118,620, Cl. 219-124.320.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Brey, Hans; and Geise, Philip E., Jr. FM/CW radar system. 4,118,701, Cl. 343-6.00R.
Fraser, Alan S.; Wells, Arthur F.; and Tenoso, Harold J. Water system virus detection. 4,118,315, Cl. 210-23.00F.
Knoell, Albert C.; and Wilson, Abraham H. Vehicular impact absorption system. 4,118,014, Cl. 256-1.000.
National Aeronautics and Space Administration: *See—*
Bernstein, Albert J., 4,118,666, Cl. 324-77.00C.
Connolly, Denis J., 4,118,671, Cl. 330-43.000.
Economu, Merle A., 4,117,749, Cl. 81-9.50R.
Heller, Jack A., 4,117,669, Cl. 60-39.140.
Heyman, Joseph S., 4,117,731, Cl. 73-579.000.
Reinhardt, Victor S., 4,118,665, Cl. 324-57.00R.
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Cooke, Gordon R.; and Franklin, Kevin T., 4,118,709, Cl. 346-33.00R.
Johnson, Leopold J., 4,117,588, Cl. 29-608.000.
Rahn, John P.; and Scott, Marion L., 4,118,675, Cl. 331-94.50C.
Regelson, Ephraim; Terral, Leonard G.; Matusiak, Ronald J.; Trotter, Jerry L.; Rea, William L.; and Mangel, Edward L., 4,117,967, Cl. 228-20.000.
Simpson, Homer L., 4,118,685, Cl. 340-146.30P.
U.S. Philips Corporation: *See—*
Bouwhuis, Gijsbertus; Braat, Josephus Johannes Maria; and Jacobs, Bernardus Antonius Johannus, 4,118,734, Cl. 358-128.000.
Guilleman, Lionel; and Thillays, Jacques Claude, 4,118,633, Cl. 250-551.000.
Hargreaves, Clifford McDonald, 4,117,695, Cl. 62-86.000.
Jans, Johannes M., 4,118,234, Cl. 106-1.230.
Stromberger-D'Alton-Rauch, Ilse-Dore; Klose, Karl; Bergmann, Udo; Glattli, Alfred; and Hodum, Claus-Peter, 4,118,229, Cl. 96-27.00H.
Weiss, Hermann; Klotz, Erhard; and Tiemens, Ulf, 4,118,099, Cl. 350-3.730.
Wolber, Jorg, 4,118,655, Cl. 315-371.000.
U.S. Rubber Reclaiming Co., Inc.: *See—*
LaGrone, Bobby D.; and Huff, Bobby J., 4,118,137, Cl. 404-76.000.
United States Steel Corporation: *See—*
Bowman, Walter A.; and Wessel, Richard L., 4,118,284, Cl. 202-248.000.
Golas, Eugene A.; and Singh, Shri N., 4,117,959, Cl. 222-590.000.
Hendrickson, Luther G., 4,118,017, Cl. 266-187.000.
Pignocco, Arthur J.; and Kachik, Robert H., 4,117,868, Cl. 138-146.000.
Rutherford, Kenneth S., 4,117,879, Cl. 164-412.000.
Wilhelm, Thomas K., 4,118,207, Cl. 55-338.000.
United Technologies Corporation: *See—*
Brose, Harlan F., 4,117,786, Cl. 110-229.000.
Dierberger, James Albert, 4,118,146, Cl. 416-97.00A.
Elsaesser, Fred L.; and Hall, Joseph H., 4,117,668, Cl. 60-39.030.
Paduch, Stanley R.; and Smith, Lawrence S., 4,117,765, Cl. 91-361.000.
Universal Photocopy, Inc.: *See—*
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University of California, The Regents of the: *See—*
Apple, Martin A.; and Formica, Joseph V., 4,118,482, Cl. 424-177.000.
Brown, Daniel Maitland, 4,118,060, Cl. 294-83.00R.
Friedel, William C., Jr.; and Dietz, Charles F., 4,118,311, Cl. 209-75.000.
University of Illinois Foundation: *See—*
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University of Notre Dame du Lac: *See*—
D'Alelio, Gaetano F., 4,118,377, Cl. 526-236.000.
University of Utah: *See*—
Cutler, Ivan B., 4,118,464, Cl. 423-346.000.
UOP Inc.: *See*—
Fritsch, Thomas R.; and Anderson, Mark C., 4,118,429, Cl. 260-674.0SA.
Latos, Edwin J., 4,118,339, Cl. 252-417.000.
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Upjohn Company, The: *See*—
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Nelson, Norman A., 4,118,577, Cl. 560-53.000.
Peterson, David C., 4,118,591, Cl. 560-53.000.
Peterson, David C., 4,118,591, Cl. 560-53.000.
Smith, Herman W., 4,118,416, Cl. 562-503.000.
Wechter, William J.; and Brooks, Carter D., 4,118,484, Cl. 424-180.000.
Yankee, Ernest W., 4,118,578, Cl. 560-121.000.
Yankee, Ernest W., 4,118,579, Cl. 560-121.000.
Yankee, Ernest W., 4,118,580, Cl. 560-121.000.
Yankee, Ernest W., 4,118,581, Cl. 560-121.000.
Uragami, Masaharu: *See*—
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Urbanek, Karel: *See*—
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Urchick, Demetrius: *See*—
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Usui, Shyoichiro: *See*—
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Utsler, Charles S. Fishing pole with spaced illuminating means. 4,117,618, Cl. 43-17.500.
Uyeda, Tim M. Key decoding and duplicating apparatus and method. 4,117,763, Cl. 90-13.050.
Vacval, Dusan M.; and Domes, E. A., to International Harvester Company. Torque bars for sliding caliper disc brake. 4,117,911, Cl. 188-73.300.
Vadetec Corporation: *See*—
Kemper, Yves Jean; and Pouliot, Harvey N., 4,117,736, Cl. 74-60.000.
Vaguine, Victor A., to Varian Associates, Inc. Linear accelerator having a side cavity coupled to two different diameter cavities. 4,118,652, Cl. 315-5.410.
Vaguine, Victor Aleksey, to Varian Associates, Inc. Variable energy highly efficient linear accelerator. 4,118,653, Cl. 315-5.410.
Vale, Corwyn Philip: *See*—
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Van De Mark, Garin M., to Woodward Governor Company. Fuel control system for a prime mover. 4,117,857, Cl. 137-117.000.
Van Den Essen, Louis. Optical typewriter. 4,118,128, Cl. 400-118.000.
van der Lely, Cornelis. Watches. 4,117,662, Cl. 58-50.00R.
VanderMey, Donald M., to Packaging Corporation of America. Shipping unit and method of loading same. 4,117,929, Cl. 206-326.000.
Vanderstar, Cornelius Christian. Thermal barrier system for panel installations. 4,117,640, Cl. 52-398.000.
VanderWert, Terry L., to Buckbee-Mears Company. Process for albedo control of molybdenum articles. 4,118,252, Cl. 148-6.300.
Van Dewoestine, Robert V.: *See*—
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Vanlerberghe, Guy; and Rosenbaum, Georges, to L'Oreal. Aminated γ-dialdehyde; methods for preparing the same and cosmetic compositions containing the same. 4,118,423, Cl. 260-584.00A.
Van Praag, Michel; and Duijf, Gerrit, to International Flavors & Fragrances Inc. Use of caramel color for augmenting or enhancing or intensifying the color of natural red dyestuffs. 4,118,516, Cl. 426-96.000.
Vargiu, Silvio; Carpaneti, Edoardo; Crespolini, Giancarlo; and Pitzalis, Mario, to Euteco, S.p.A. Process for the preparation of petroleum resins. 4,118,555, Cl. 526-76.000.
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Vaguine, Victor A., 4,118,652, Cl. 315-5.410.
Vaguine, Victor Aleksey, 4,118,653, Cl. 315-5.410.
Varlamov, Vladimir Matveevich. Device for producing acoustic vibration in flowing liquid or gaseous medium. 4,118,796, Cl. 366-124.000.
Varley, Robert Fred, to Harris Corporation. Adaptive interface for rotational positioning device utilizing linear actuators. 4,118,705, Cl. 343-100.0AD.
Vary, Eva M.; and Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Fluorocarbon polymer coatings. 4,118,537, Cl. 428-422.000.
Vassiliou, Eustathios: *See*—
Vary, Eva M.; and Vassiliou, Eustathios, 4,118,537, Cl. 428-422.000.
Vaughan, Curtis T. Rocker assembly for wheelchairs. 4,118,046, Cl. 280-289.0WC.
Veazey, Thomas M., to Monsanto Company. Method for annealing acrylonitrile-containing filaments. 4,118,190, Cl. 8-149.300.
VEB Pentacon Dresden Kamera-und Kinowerke: *See*—
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Velsicol Chemical Company: *See*—
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Versatile Manufacturing Ltd.: *See*—
Pakosh, Daniel, 4,117,849, Cl. 130-27.00Q.
Vertegaal, Jacobus Gerardus, to Stork Brabant B.V. Means to provide uniform lengthwise squeegee angle of attack. 4,117,779, Cl. 101-120.000.
Via, Francis A., to Stauffer Chemical Company. Photopolymerizable aryl and heterocyclic glyoxylamide compositions. 4,118,298, Cl. 204-159.230.
Vickers-Intertek Limited: *See*—
Ball, Kenneth, 4,117,688, Cl. 405-188.000.
Victor Company of Japan, Limited: *See*—
Iwahara, Makoto; and Mori, Toshinori, 4,118,599, Cl. 179-1.00G.
Victor, Joe M.; and Dougherty, James, to Petrolite Corporation. Coulometric titrator. 4,118,300, Cl. 204-195.00T.
Vigerie, Robert, to Creusot-Loire. Hydraulic device for a stabilizing beam in a machine used on uneven terrain. 4,118,054, Cl. 280-765.000.
Villanova University: *See*—
Yeh, George Chiayou, 4,118,285, Cl. 203-81.000.
Vind, Holger Vilhelm, to Danfoss A/S. Starting device for an asynchronous motor. 4,118,753, Cl. 361-331.000.
Visser, Johannes; Oosthoek, Raoul Henricus Josephus; Groeneweg, Jan Willem; and Dijkstra, Hendrik, to Thomas J. Lipton, Inc. Protein fibres. 4,118,520, Cl. 426-574.000.
Vnek, John: *See*—
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, 4,118,478, Cl. 424-89.000.
Prince, Alfred M.; Vnek, John; Neurath, Robert A.; and Trepo, Christian, 4,118,479, Cl. 424-89.000.
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Voelger, Karl-Dieter; Rietzel, Christian; and Lehmann, Klaus, to Rohm GmbH. Diuretic pharmaceutical compositions and method of use containing the sulfuric acid half-ester of 2,4,7-triamino-6p-hydroxyphenyl pteridine. 4,118,492, Cl. 424-251.000.
Vogel, Karl Heinz, to Gebruder Kommerling Kunststoffwerke G.m.b.H. Synthetic resin frames and a process for their production. 4,118,267, Cl. 156-293.000.
Vogel, Robert E., to Kysor Industrial Corporation. Refrigerated display. 4,117,698, Cl. 62-256.000.
Voigt, K. J., to Max-Planck-Gesellschft zur Forderung der Wissenschaften e.V. Optical coupling. 4,118,105, Cl. 350-96.200.
Volker, Herbert; Koberstein, Edgar; and Hensel, Jorg, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Monolithic carrier catalyst and arrangements of such a catalyst for the purification of exhaust gases from an internal combustion engine. 4,118,199, Cl. 422-171.000.
Vollmer, Hartfrid; and Hestermann, Klaus, to Hoechst Aktiengesellschaft. Phosphorbetaines and process for making them. 4,118,590, Cl. 560-190.000.
Volness, Kenneth H.: *See*—
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von Dreusche, Charles F., Jr.; and Barry, Louis T., to Nichols Engineering & Research Corp. Method for treating waste material. 4,118,220, Cl. 75-69.000.
von Schuckmann, Alfred. Receptacle for the portioned dispensing of the contents thereof. 4,117,956, Cl. 221-288.000.
Vorchheimer, Norman, to Betz Laboratories, Inc. Method and composition of a polymer in convenient liquid form. 4,118,355, Cl. 260-29.6PT.
Vostrowsky, Otto: *See*—
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Vrana, Charles K. Vertical lift device. 4,117,992, Cl. 244-23.00C.
Wacker-Chemie GmbH: *See*—
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Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See*—
Rahn, Oskar; and Krause, Hermann, 4,118,058, Cl. 294-67.00B.
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Wagner Electric Corporation: *See*—
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Mild, William M., 4,118,076, Cl. 303-6.00C.
Wagner, Paul-Heinz; Hirtsiefer, Richard; and Muller, Johann, to Paul-Heinz Wagner Maschinenfabrikation. Power wrench. 4,117,735, Cl. 74-47.000.
Walker, Charles Carey, to Du Pont de Nemours, E. I., and Company. Purification of spent ethylene glycol. 4,118,582, Cl. 560-96.000.
Walker, Erich, to Bulova Watch Company, Inc. Casing ring for watch movement. 4,117,660, Cl. 58-23.00R.
Wall Colmonoy Corporation: *See*—
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United States of America, National Aeronautics and Space Administration; Wall, William A., Jr.; Ives, Robert E.; Bruce, Miles Melvin, Jr.; Pryor, Peter Paul, Jr.; and Gard, Leslie H., 4,118,620, Cl. 219-124.320.

Wallace, Charles H., to International Telephone and Telegraph Corporation. Computer directed primal cut indicating device. 4,118,777, Cl. 364-475.000.

Wallace Energy Conversion, Inc.: *See—*
Wallace, Floyd D., 4,118,282, Cl. 201-2.500.

Wallace, Floyd D., to Wallace Energy Conversion, Inc. Process and apparatus for the destructive distillation of high molecular weight organic materials. 4,118,282, Cl. 201-2.500.

Wallshein, Melvin. Apparatus and method for mounting orthodontic appliances to teeth. 4,117,596, Cl. 32-14.00R.

Walser, Armin, to Hoffmann-La Roche Inc. Synthesis of imidazo[1,5-a]diazepine-3-carboxylates. 4,118,386, Cl. 260-239.30T.

Walter, Lothar: *See—*
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Walter, Peter Frank, to Wall Colmonoy Corporation. Controlled atmosphere and vacuum processes. 4,118,542, Cl. 428-553.000.

Walton, John Monte: *See—*
Burns, Simon Pierce; and Walton, John Monte, 4,118,286, Cl. 203-89.000.

Wampole, Nevin C., to United States of America, Energy. Nuclear reactor insulation and preheat system. 4,118,278, Cl. 176-87.000.

Wang, Chia-Gee. Separation of gases. 4,118,205, Cl. 55-17.000.

Wang, Teh Po; and Starr, Carrol Dean, to Wilbur B. Driver Company. Nickel-chromium heating element alloy having improved operating life. 4,118,224, Cl. 75-171.000.

Ward, Elizabeth: *See—*
Ward, Nazareen, 4,117,805, Cl. 119-5.000.

Ward, Howard; and Tschirky, John, to Smith International, Inc. Apparatus and method for enlarging underground arcuate bore holes. 4,117,895, Cl. 175-53.000.

Ward, John H.: *See—*
Parrent, George B., Jr.; and Ward, John H., 4,118,107, Cl. 350-162.0SF.

Ward, Nazareen, to Ward, Elizabeth; Tribble, John; Gordon, Lee; and Irving, Frank. Vivarium. 4,117,805, Cl. 119-5.000.

Ward, Timothy J., to Raymond Lee Organization, Inc., The. Vehicular lug nut cleaning device. 4,117,566, Cl. 15-244.00R.

Warning, Klaus: *See—*
Mitzlaff, Michael; Warning, Klaus; and Jensen, Harald, 4,118,500, Cl. 424-267.000.

Warther, Donald Paul, to Hughes Aircraft Company. Precision voltage to frequency converter for use in A/D converter. 4,118,696, Cl. 340-347.0NT.

Wasmuth, Edward H.: *See—*
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Waste Management of Illinois, Inc.: *See—*
Sandesara, Mahendra D., 4,118,243, Cl. 106-109.000.

Watanabe, Akinori; Tanoshima, Katsuhide; Noguchi, Matsusaburo; and Hattori, Kinya, to Oki Electric Industry Co., Ltd. High speed printer with arc preventing fluorocarbon gas. 4,117,778, Cl. 101-1.000.

Watanabe, Katsumi, to Yugen Kaisha Watanabe Kenkusho. Vibration transmission mechanism for a phonograph. 4,118,038, Cl. 274-9.00B.

Watanabe, Seiichi: *See—*
Ichijima, Isamu; Watanabe, Seiichi; and Miyagawa, Kazuo, 4,118,732, Cl. 358-101.000.

Watanabe, Takeshi; Nishimaki, Kazuo; Shimanuki, Kazuo; Mita, Katuo; and Konno, Satoru, to Nitto Boseki Co., Ltd. Method and apparatus for manufacturing glass fibers using deflectable air curtain. 4,118,210, Cl. 65-2.000.

Watkins, Mervyn M. Folding patio chair. 4,118,065, Cl. 297-45.000.

Watkinson, Alan Paul: *See—*
Oloman, Colin William; and Watkinson, Alan Paul, 4,118,305, Cl. 204-265.000.

Watson, Spencer C.: *See—*
Eidt, Scott H.; Watson, Spencer C.; and Heilig, George Charles, 4,118,409, Cl. 260-448.00A.

Watts, Keith Ernest, to Wiltshire Cutlery Company Proprietary Limited. Knife scabbard and sharpening device. 4,117,748, Cl. 76-86.000.

Waxelbaum, Paul M.; Harris, Fred A.; and Brown, William J., to Olin Corporation. Granulator with beater bar and deflector. 4,117,984, Cl. 241-73.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
Bienert, Horst; and Jardin, Hans, 4,118,063, Cl. 296-137.00B.

Webb, David B., to Irvin Industries Canada Ltd. Parachute with canopy opening assist and opening control. 4,117,994, Cl. 244-152.000.

Webb, David B.: *See—*
Palm, Lorenz A.; and Webb, David B., 4,117,993, Cl. 244-145.000.

Weber, Georg: *See—*
Krause, Joachim; Streinstrasser, Ralf; Pohl, Ludwig; Del Pino, Fernando; and Weber, Georg, 4,118,335, Cl. 252-299.000.

Weber, Harold James, to Weber, Harold James. Apparatus including bifrequency electromagnetic wave generation means for sympathetic excitation of detached conductive structures. 4,118,662, Cl. 324-3.000.

Weber, Jerome B. Soil sampler. 4,117,896, Cl. 175-84.000.

Weber, Kurt, to Ciba-Geigy Corporation. Substituted 1,4-bis-styrylbenzene and 4,4'-bis styrylbiphenyl and their use as optical brightners. 4,118,560, Cl. 542-447.000.

Weber, Paul; Lankes, Erich; Butschko, Gerhard; Ritzmann, Horst; and Bohm, Peter Wolfgang, to Polysius AG. Apparatus and method for calcining or sintering fine-grained material. 4,118,177, Cl. 432-14.000.

Webster, Harold F.: *See—*
Cusano, Dominic A.; and Webster, Harold F., 4,118,758, Cl. 362-6.000.

Webster, Richard G.: *See—*
Lazet, Frank J.; Meador, D. John; and Webster, Richard G., 4,118,463, Cl. 423-334.000.

Wechter, William J.; and Brooks, Carter D., to Upjohn Company, The. Method of treating rheumatoid arthritis. 4,118,484, Cl. 424-180.000.

Wedding, Brent M., to Corning Glass Works. Treating polychromatic glass in reducing atmospheres. 4,118,214, Cl. 65-30.00R.

Weinar, Roger Neil. Wallboard fastener. 4,117,644, Cl. 52-714.000.

Weinberg, Glen Lee: *See—*
Turner, Robert Bruce; and Weinberg, Glen Lee, 4,117,926, Cl. 206-306.000.

Weinberger, Arnold: *See—*
Levine, Samuel R.; Singh, Shanker; and Weinberger, Arnold, 4,118,786, Cl. 364-783.000.

Weir, David F., to Westinghouse Electric Corp. Shock absorbing pad with keyed struts. 4,118,019, Cl. 267-153.000.

Weisman & Allen: *See—*
Williams, William J., 4,117,835, Cl. 128-2.05M.

Weiss, Hermann; Klotz, Erhard; and Tiemens, Ulf, to U.S. Philips Corporation. Image coding and decoding using coherent codes. 4,118,099, Cl. 350-3.730.

Welder, Gerald Elvin; Lang, Edward Russell; and Slagle, Charles Wilmer, to Calgon Corporation. Gas scrubber scale and deposit control. 4,118,318, Cl. 210-58.000.

Weldon, James O., to Continental Electronics Manufacturing Company. Pulse width modulating circuit. 4,118,677, Cl. 332-9.00R.

Welgemoed, Jacobus Cornelius: *See—*
Dugan, Bernard Baron; and Welgemoed, Jacobus Cornelius, 4,118,333, Cl. 252-135.000.

Wellner, Wolfgang: *See—*
Pedain, Josef; Wellner, Wolfgang; Gruber, Hermann; and Dietrich, Manfred, 4,118,376, Cl. 528-59.000.

Wells, Arthur F.: *See—*
United States of America, National Aeronautics and Space Administration; Fraser, Alan S.; Wells, Arthur F.; and Tenoso, Harold J., 4,118,315, Cl. 210-23.00F.

Wells, David Lee, to Johns-Manville Corporation. Insulation system for building structures. 4,117,641, Cl. 52-404.000.

Wenger, La Von Gene; Clark, Douglas S.; and Hauck, Bobbie W., to Wenger Manufacturing. High-output apparatus for producing dense, uniformly layered meat analogue product. 4,118,164, Cl. 425-202.000.

Wenger Manufacturing: *See—*
Wenger, La Von Gene; Clark, Douglas S.; and Hauck, Bobbie W., 4,118,164, Cl. 425-202.000.

Werner & Pfleiderer: *See—*
Gnadig, Gerhard; and Seufert, Wilhelm, 4,117,583, Cl. 29-447.000.

Werntz, Charles W., to Alvey Inc. Drive means for roller conveyors. 4,117,923, Cl. 198-790.000.

Wessel, Richard L.: *See—*
Bowman, Walter A.; and Wessel, Richard L., 4,118,284, Cl. 202-248.000.

Westbrook, Samuel T. Amusement toy or gyro disc. 4,118,031, Cl. 273-110.000.

Westeren, Herbert W.; and Harrison, Ronald A., to C.I. Hayes Inc. Continuous heat treating vacuum furnace. 4,118,016, Cl. 266-130.000.

Western Electric Company, Inc.: *See—*
Bassett, Henry C.; From, Charles A., Jr.; Parker, John F.; and Worley, Ansel A., 4,118,596, Cl. 174-87.000.
Rapp, Willard Emanuel, 4,117,590, Cl. 29-764.000.

Western Geophysical Co. of America: *See—*
Mollere, John C., 4,117,780, Cl. 102-22.00R.

Western Kentucky University: *See—*
Holy, Norman L.; and Nalesnik, Theodore E., 4,118,426, Cl. 260-615.00B.

Westinghouse Air Brake Company: *See—*
Franke, Raymond C., 4,118,774, Cl. 364-431.000.
Noble, Peter M., 4,118,126, Cl. 356-123.000.

Westinghouse Electric Corp.: *See—*
Barrett, Joseph F.; and Kiscaden, Roy W., 4,118,635, Cl. 290-40.00R.
Borona, Russell T., 4,118,680, Cl. 335-176.000.
Calfo, Raymond M.; Dailey, George F.; Alkire, Gerald R.; and Mulach, Arthur, 4,118,645, Cl. 310-53.000.
Davies, Norman; Langley, Morley P.; and Peppel, Howard C., deceased, 4,118,755, Cl. 361-379.000.
Dickens, Lawrence E., 4,118,670, Cl. 325-446.000.
Goldstein, Norman P.; and Todt, William H., 4,118,626, Cl. 250-370.000.
Kolesar, Mark; and Rettger, Harry C., 4,117,707, Cl. 72-306.000.
Lackey, Robert S.; Young, Robert R.; and Kastovich, John C., 4,118,083, Cl. 312-100.000.
Phillips, David C.; Hickam, William M.; and Carlson, Gerald L., 4,117,713, Cl. 73-17.00R.
Rosey, Richard; Kovatch, George N.; and Simon, Ned H., 4,118,639, Cl. 307-147.000.
Shoupp, William E.; Bratkowski, Walter V.; and Boomgaard, Dirk J., 4,118,717, Cl. 354-43.000.
Stahl, William F., 4,118,145, Cl. 416-96.00R.
Weir, David F., 4,118,019, Cl. 267-153.000.

Weyerhaeuser Company: *See—*
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Whirlpool Corporation: *See—*
Brenner, Robert A.; Cuthbert, Victor W.; and Braga, Albert T., 4,118,647, Cl. 310-239.000.
Schaus, John Joseph, 4,118,451, Cl. 264-46.500.
White, Allen A.; Yatcilla, George; and Case, Cecil L., to Hesston Corporation. Tying needle safety control for crop balers. 4,117,775, Cl. 100-19.00R.
White, James E., to Monsanto Company. Recovery of maleic anhydride. 4,118,403, Cl. 260-346.760.
White, Letcher T.: *See—*
Kelley, Jay Hilary; and White, Letcher T., 4,118,072, Cl. 299-43.000.
Whitehead, Edward. Seed drill including discs driven by ground wheel drive. 4,117,788, Cl. 111-52.000.
Whitlock, Jacob O., to Structural Rubber Products Company. Highway-railway crossing. 4,117,977, Cl. 238-8.000.
Wichert, Wolfgang: *See—*
Knotek, Otto; Lugscheider, Erich; and Wichert, Wolfgang, 4,118,254, Cl. 148-32.000.
Wiechert, Rudolf: *See—*
Philippson, Rainer; Krieger, Bernhard; Casals-Stenzel, Jorge; Kerb, Ulrich; Losert, Wolfgang; Prezewowsky, Klaus; Wiechert, Rudolf; and Bittler, Dieter, 4,118,488, Cl. 424-238.000.
Wiegner, Joseph R.: *See—*
Charles, Ronald A.; Jones, Paul W.; Staples, John L.; and Wiegner, Joseph R., 4,118,280, Cl. 195-127.000.
Wikel, James H.: *See—*
Paget, Charles J.; and Wikel, James H., 4,118,573, Cl. 548-306.000.
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., 4,118,742, Cl. 548-306.000.
Wiklund, Henry: *See—*
Nilsson, Goran Alfred; Edstrom, Kjell; and Wiklund, Henry, 4,117,764, Cl. 91-50.000.
Wilbur B. Driver Company: *See—*
Wang, Teh Po; and Starr, Carrol Dean, 4,118,224, Cl. 75-171.000.
Wilburn, Everett R.; and Sorter, James A. Egg sheller. 4,117,774, Cl. 99-568.000.
Wiley, Philip A.: *See—*
Richardson, Carl; Stoddart, Hugh F.; and Wiley, Philip A., 4,117,935, Cl. 209-586.000.
Wilhelm, Thomas K., to United States Steel Corporation. Rotating disc particulate separator. 4,118,207, Cl. 55-338.000.
Wilkinson, Richard L., to MCA Disco-Vision, Inc. Synchronous detection tracking of video disc. 4,118,735, Cl. 358-128.000.
Williams, Frank R., to Consolidated Medical Equipment. Skin conducting electrode and electrode assembly. 4,117,846, Cl. 128-303.130.
Williams, Glenn L., to Stoelker, Charles V. Pharmaceutical preparation for treating hemorrhoids and anal fissures. 4,118,480, Cl. 424-131.000.
Williams, Philip David Lane, to Decca Limited. Pulse radar apparatus. 4,118,703, Cl. 343-17.20R.
Williams, Thomas E.; and Cygnarowicz, Thomas A., to United States of America, National Aeronautics and Space Administration. System for and method of freezing biological tissue. 4,117,881, Cl. 165-2.000.
Williams, William J., to Weisman & Allen. Method and apparatus for blood pressure measurements. 4,117,835, Cl. 128-2.05M.
Wilson, Abraham H.: *See—*
United States of America, National Aeronautics and Space Administration; Knoell, Albert C.; and Wilson, Abraham H., 4,118,014, Cl. 256-1.000.
Wilson, David A.: *See—*
James, Robert C.; Wilson, David A.; and Horsman, Dennis P., 4,117,646, Cl. 53-488.000.
Wilson, Denney L., Sr., to NCR Corporation. Demand controlled preregulating rectifier circuit for power supplies. 4,118,768, Cl. 363-85.000.
Wilson, Denney Lee, Sr., to NCR Corporation. Full wave demand controlled preregulating supply. 4,118,769, Cl. 363-54.000.
Wilson, Dennis L.: *See—*
Schertz, Charles J.; and Wilson, Dennis L., 4,117,760, Cl. 89-33.00C.
Wilson, Michael Edwin: *See—*
Spence-Bate, Harry Arthur Hele; and Wilson, Michael Edwin, 4,118,123, Cl. 355-78.000.
Wiltshire Cutlery Company Proprietary Limited: *See—*
Watts, Keith Ernest, 4,117,748, Cl. 76-86.000.
Winckler, Richard, to Cebal. Aerosol dispenser liner. 4,117,951, Cl. 220-461.000.
Windmoller & Holscher: *See—*
Brinkmeier, Friedhelm, 4,117,771, Cl. 93-93.0HT.
Windsor, Harry Mellows, to Automotive Products Limited. Electronic control system for automatic gearboxes. 4,117,747, Cl. 74-866.000.
Wislocker, Frank: *See—*
Hasenwinkle, Earl Dean; and Wislocker, Frank, 4,117,755, Cl. 83-435.100.
Wistreich, Hugo E.: *See—*
Juhn, Hyunil; and Wistreich, Hugo E., 4,118,519, Cl. 426-533.000.
Wittenzellner, Ernst: *See—*
Murrmann, Helmuth; and Wittenzellner, Ernst, 4,118,251, Cl. 148-1.500.
Wittkamp, Heinrich; and Gehrung, Manfred, to BASF Aktiengesellschaft. Cassette, particularly a cassette for a reel of wide recording tape. 4,118,616, Cl. 206-387.000.
Witzke, Horst; Chen, Schoen-nan; Deb, Satyendra K.; and Russak, Michael A., to Optel Corporation; and Grumman Aerospace Corporation. Triple electrode photogalvanic cell with energy storage capability. 4,118,546, Cl. 429-111.000.
Witzke, Horst; Chen, Schoen-nan; Deb, Satyendra K.; Jost, Steven Robert; Reichman, Joseph; and Russak, Michael A., to Optel Corporation; and Grumman Aerospace Corporation, part interest to each. Thin film photogalvanic cell. 4,118,547, Cl. 429-111.000.
Wohrl, Alfons: *See—*
Spies, Johann; and Wohrl, Alfons, 4,117,730, Cl. 73-517.00R.
Wolber, Jorg, to U.S. Philips Corporation. Line sawtooth deflection current generator. 4,118,655, Cl. 315-371.000.
Wonneberg, Heinz: *See—*
Klein, Hans-Joachim; Rupprecht, Manfred; Wonneberg, Heinz; Geiger, Julius; and Masa, Gunter, 4,118,127, Cl. 356-200.000.
Wood, Derek A., to Shell Oil Company. Preparation of phenoxybenzyl esters. 4,118,413, Cl. 260-465.00D.
Wood, Prentice J., to Mead Corporation, The. Article carrier and blank therefor. 4,117,925, Cl. 206-186.000.
Wood, William Malcolm Logan, to Imperial Chemical Industries Limited. Smoking mixtures. 4,117,850, Cl. 131-2.000.
Woods, Jay G.: *See—*
Kidd, James M., Jr.; and Woods, Jay G., 4,117,638, Cl. 52-200.000.
Woodstream Corporation: *See—*
Conibear, Frank R., 4,117,623, Cl. 43-90.000.
Loeffler, Herbert H., 4,117,621, Cl. 43-88.000.
Loeffler, Herbert H., 4,117,622, Cl. 43-88.000.
Woodward Governor Company: *See—*
Van De Mark, Garin M., 4,117,857, Cl. 137-117.000.
Worfel, Erhard: *See—*
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Worley, Ansel A.: *See—*
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Wright, Richard L.: *See—*
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Wu, Chin Ching; and Krenzer, John, to Velsicol Chemical Company. 1-Thiazolyl-5-acyloxyimidazolidinones. 4,118,390, Cl. 260-306.80R.
Wullschleger, Hans: *See—*
Koula, Zdenek; Nirk, Peter; and Wullschleger, Hans, 4,117,799, Cl. 118-6.000.
Wurr, Jurgen: *See—*
Mollenkopf, Hans; Ritzmann, Horst; Wurr, Jurgen; Schmits, Heinz-Berbert; Heinemann, Otto; Krutzner, Karl, jun.; and Schossler, Werner, 4,118,176, Cl. 432-14.000.
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Xerox Corporation: *See—*
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Hubble, Fred F., III; and Tasseff, John B., II, 4,118,751, Cl. 361-220.000.
Maiorano, Dominick J., 4,118,119, Cl. 355-11.000.
Rees, James D.; and Lehman, Richard F., 4,118,122, Cl. 355-77.000.
Thornburg, David D., 4,118,112, Cl. 350-351.000.
Xodar Corporation: *See—*
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Yamada, Yasuo; and Seki, Masao, to Fuji Xerox Co., Ltd. Split hologram and methods of making and using same. 4,118,104, Cl. 350-3.600.
Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Yamashita, Ryuichi; and Matsumoto, Hiromitsu, 4,117,813, Cl. 123-119.00R.
Yamaichi Electric Mfg. Co., Ltd.: *See—*
Takahashi, Toru, 4,118,096, Cl. 339-99.00R.
Yamakawa Industry Co. Ltd.: *See—*
Sugiyama, Masaaki; Yuda, Takuo; and Mizusawa, Akira, 4,118,323, Cl. 210-439.000.
Yamamichi, Masayoshi: *See—*
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Yamashita, Ryuichi; and Matsumoto, Hiromitsu, to Yamaha Hatsudoki Kabushiki Kaisha. Internal combustion engine and method of operating it. 4,117,813, Cl. 123-119.00R.
Yamato Scale Company, Ltd.: *See—*
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Yamazaki, Keiji; and Katsuragi, Mamoru, to Minolta Camera Kabushiki Kaisha. Camera indicating means. 4,118,723, Cl. 354-155.000.
Yamazaki, Noboru; and Higashi, Fukuji, to Sumitomo Chemical Company, Limited. Production of aromatic polyamides from dicarboxylic acid and diamine. 4,118,374, Cl. 528-337.000.
Yamazaki, Shuichi; Kajitani, Ikuo; and Kosato, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust reaction chamber system of engine. 4,117,672, Cl. 60-282.000.
Yamazaki, Shuichi; and Kajitani, Ikuo, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust reaction assembly for internal combustion engine. 4,117,673, Cl. 60-282.000.
Yan, Tsoung-Yuan, to Mobil Oil Corporation. Production of low sulfur fuels from coal. 4,118,201, Cl. 44-1.00R.
Yan, Tsoung-Yuan, to Mobil Oil Corporation. Conversion of solid wastes to fuel coke and gasoline/light oil. 4,118,281, Cl. 201-2.500.

Yanick, Paul. Loudness contour compensated hearing aid having ganged volume, bandpass filter, and compressor control. 4,118,604, Cl. 179-107.0FD.

Yankee, Ernest W., to Upjohn Company, The. 5-Oxa-11-deoxy-cis-13-PGE_1, compounds. 4,118,578, Cl. 560-121.000.

Yankee, Ernest W., to Upjohn Company, The. 5-Oxa-11-deoxy-cis-13-$PGF_{1\alpha}$ compounds. 4,118,579, Cl. 560-121.000.

Yankee, Ernest W., to Upjohn Company, The. 5-Oxa-cis-13-PGA, compounds. 4,118,580, Cl. 560-121.000.

Yankee, Ernest W., to Upjohn Company, The. 5-Oxa-cis-13-PGE_1 compounds. 4,118,581, Cl. 560-121.000.

Yardney Electric Corporation: *See*—
Chireau, Roland F.; and Gunther, Ronald G., 4,118,551, Cl. 429-207.000.
Chireau, Roland F.; and Berchielli, Aldo S., 4,118,552, Cl. 429-219.000.

Yatcilla, George: *See*—
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Yates, George A. Combination bulldozer blade and bucket assembly for earth working equipment. 4,117,610, Cl. 37-117.500.

Yazane, Shigeru; and Mogami, Youetsu, to Honda Giken Kogyo Kabushiki Kaisha. Collapsible steering column. 4,117,741, Cl. 74-492.000.

Yeap, Arthur K. C., to Audio Developments International. System and a method for equalizing an audio sound transducer system. 4,118,601, Cl. 179-1.00D.

Yeda Research and Development Co. Ltd.: *See*—
Haviv, Fortuna; and Patchornik, Abraham, 4,118,562, Cl. 544-26.000.

Yeh, George Chiayou, to Villanova University. Separation of liquid mixtures. 4,118,285, Cl. 203-81.000.

Yokokawa, Yasuo: *See*—
Morishita, Masataka; Yokokawa, Yasuo; Nishikawa, Tokio; Mishiro, Masahiro; Ohashi, Shigeyasu; Fukushima, Mitsuru; Inaba, Yoshihito; and Matsuda, Tetsuo, 4,118,336, Cl. 252-316.000.

Yokota, Reizo, to Kabushiki Kaisha Yodogawaseikosho. Method of manufacturing large-sized centrifugally cast composite roll and device for disposing lower side pouring sprue runner used in the method. 4,117,877, Cl. 164-95.000.

Yokoyama, Akinori; and Komatsu, Mitsuaki, to Kabushiki Kaisha Komatsu Seisakusho. Torque converter and planetary gear set therefor. 4,117,745, Cl. 74-688.000.

Yokoyama, Takushi; Kojima, Hidetaka; Uragami, Masaharu; and Miwa, Kathuyoshi, to Daicel, Ltd. Process for producing pyridine. 4,118,388, Cl. 260-290.00R.

Yoneda, Kichi. Emergency system for stopping a band blade of a cutting apparatus. 4,117,752, Cl. 83-58.000.

Yoshida, Fumitake, to Seisan Kaihatsu Kagaku Kenkyusho. Apparatus for treatment of artificial kidney dialyzing fluid. 4,118,314, Cl. 210-22.00C.

Yoshida, Takashi; and Kobayashi, Kenzo, to Tokyo Shibaura Electric Co., Ltd. Gyro stabilized platform for scanning antenna. 4,118,707, Cl. 343-765.000.

Yoshida, Toshiro, to Toyota Jidosha Kogyo K.K. Throttle valve positioner. 4,117,811, Cl. 123-103.00R.

Yoshida, William Goro. Knotless fish line connector. 4,117,574, Cl. 24-129.00R.

Yoshioka, Takao: *See*—
Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,118,368, Cl. 260-45.80N.

Yother, Cecil L. Honing plate. 4,117,633, Cl. 51-262.00R.

Young, Clarence W., III: *See*—
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Young, James O.: *See*—
O'Neil, Charles P.; Smorzaniuk, Adam; and Young, James O., 4,118,005, Cl. 251-75.000.

Young, Robert R.: *See*—
Lackey, Robert S.; Young, Robert R.; and Kastovich, John C., 4,118,083, Cl. 312-100.000.

Young, Rodney Christopher: *See*—
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,118,496, Cl. 424-263.000.
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,118,502, Cl. 424-273.00R.

Young, Timothy Tung Jen. Reciprocating lever friction drive mechanism for a bicycle or other occupant propelled vehicle. 4,117,915, Cl. 280-255.000.

Youngers, Stephen Anthony, to J. I. Case Company. Adjustable mounting for subterranean tool. 4,117,890, Cl. 172-40.000.

Yuda, Takuo: *See*—
Sugiyama, Masaaki; Yuda, Takuo; and Mizusawa, Akira, 4,118,323, Cl. 210-439.000.

Yugen Kaisha Watanabe Kenkusho: *See*—
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Yuma Desert Manufacturing, Inc.: *See*—
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Zakrzewski, Jan: *See*—
Najmowicz, Zenon; Dyrda, Edward; and Zakrzewski, Jan, 4,117,878, Cl. 164-292.000.

Zamin, Mohammed: *See*—
Mayer, Peter; Blair, Robert W.; and Zamin, Mohammed, 4,118,301, Cl. 204-202.000.

Zamotin, Rodvinon I. Patient lift device. 4,117,561, Cl. 5-83.000.

Zauderer, Bert: *See*—
Coppa, Anthony Patrick; and Zauderer, Bert, 4,118,643, Cl. 310-11.000.

Zenith Radio Corporation: *See*—
Rypkema, Jouke N., 4,118,740, Cl. 358-195.000.

Zentz, William E.: *See*—
Marchetti, Francis R.; Zentz, William E.; and Berube, Richard R., 4,118,247, Cl. 106-308.00N.

Ziegler, Bertram Randall; and Matteson, Edward J., to GAF Corporation. Continuous wet-laid process for making high-strength glass fiber mats. 4,118,272, Cl. 162-156.000.

Zjukin, Nikolai Stepanovich: *See*—
Naidich, Jury Vladimirovich; Kolesnichenko, Galina Alexeevna; Zjukin, Nikolai Stepanovich; Kostjuk, Boris Dmitrievich; Shaikevich, Stanislava Stanislavovna; Motsak, Yaroslav Feodosievich; Fedulaev, Vitaly Pavlovich; Kolchemanov, Nikolai Alexandrovich; Ugarov, Valentin Mikhailovich; Losev, Viktor Vasilievich; Drui, Mark Simonovich; Lavrinovich, Alla Alexandrovna; Shpotakovsky, Dmitry Fedorovich; and Chizhov, Stanislav Viktorovich, 4,117,968, Cl. 228-124.000.

Zobel, Don W.: *See*—
Jarrett, Robert B.; and Zobel, Don W., 4,117,819, Cl. 123-148.00E.

Zocher, Josef: *See*—
Current, Wayne A.; Genge, Bruce I.; Hurme, Herbert J.; and Zocher, Josef, 4,117,791, Cl. 112-222.000.

Zodrow, Rudolf; and Hoveler, Egon, to Jagenberg-Werke AG. Labeling station. 4,118,269, Cl. 156-560.000.

Zollinger, J. Lamar: *See*—
Beardsley, James L.; and Zollinger, J. Lamar, 4,118,536, Cl. 428-413.000.

Zuech, Ernest A.: *See*—
Murtha, Timothy P.; and Zuech, Ernest A., 4,118,434, Cl. 260-668.00R.

Zurawski, Egon: *See*—
Meier, Heinz; Zurawski, Egon; and Greppmaier, Paul, 4,117,739, Cl. 74-404.000.

Zyliss Zysett AG: *See*—
Hartmann, Horst, 4,117,980, Cl. 241-37.500.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 373,344	4,053,067	Feb. 3, 1976	Oct. 11, 1977
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 405,899	4,097,710	Mar. 23, 1976	Mar. 21, 1978
B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 449,989	4,061,572	Mar. 30, 1976	Dec. 6, 1977
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,257	4,078,715	Jan. 13, 1976	Mar. 14, 1978
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977
B 461,752	4,016,541	Apr. 20, 1976	Apr. 5, 1977
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 469,228	4,052,954	Feb. 17, 1976	Oct. 11, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977
B 471,706	4,076,275	Mar. 16, 1976	Feb. 28, 1978
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 475,801	4,056,759	Mar. 30, 1976	Nov. 1, 1977
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 478,759	4,055,681	Mar. 16, 1976	Oct. 25, 1977
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,711	4,053,467	Mar. 23, 1976	Oct. 11, 1977
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,439	4,057,521	Apr. 13, 1976	Nov. 8, 1977
B 494,440	4,056,502	Feb. 17, 1976	Nov. 1, 1977
B 494,450	4,079,029	Feb. 17, 1976	Mar. 14, 1978
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,124	4,060,968	Mar. 9, 1976	Dec. 6, 1977
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,490	4,118,377	Mar. 23, 1976	Oct. 3, 1978
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,128	4,072,723	Feb. 24, 1976	Feb. 7, 1978
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,456	4,080,349	Mar. 9, 1976	Mar. 21, 1978
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,216	4,076,261	Feb. 17, 1976	Feb. 28, 1978
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 537,990	4,057,651	Jan. 13, 1976	Nov. 8, 1977
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 632,416	4,076,698	Mar. 9, 1976	Feb. 28, 1978
B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 3RD DAY OF OCTOBER, 1978

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Coker, George T., Jr.: *See*—
Hansen, David R.; and Coker, George T., Jr., T975,004, Cl. 260-829.000.

Coney, Charles H.: *See*—
Leonard, Don R.; and Coney, Charles H., T975,003, Cl. 427-407.00R.

FMC Corporation: *See*—
Linda, Frederick William, T975,002, Cl. 210-62.000.

Griffin, Anselm C., Jr.: *See*—
Mangialardi, Gino J., Jr.; and Griffin, Anselm C., Jr., T975,001, Cl. 19-66.0CC.

Hansen, David R.; and Coker, George T., Jr., to Shell Oil Company. Oil-free, pressure sensitive adhesive. T975,004, 10-3-78, Cl. 260-829.000.

Leonard, Don R.; and Coney, Charles H. Primer coating compositions comprising polyalkyleneimine and cellulose-acetate propionate. T975,003, 10-3-78, Cl. 427-407.00R.

Linda, Frederick William, to FMC Corporation. Method for controlling biofouling in drip irrigation system emitter orifices. T975,002, 10-3-78, Cl. 210-62.000.

Mangialardi, Gino J., Jr.; and Griffin, Anselm C., Jr., to United States of America, Agriculture. Apparatus for conditioning seed cotton. T975,001, 10-3-78, Cl. 19-66.0CC.

Shell Oil Company: *See*—
Hansen, David R.; and Coker, George T., Jr., T975,004, Cl. 260-829.000.

Agriculture: *See*—
Mangialardi, Gino J., Jr.; and Griffin, Anselm C., Jr., T975,001, Cl. 19-66.0CC.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF OCTOBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ames, Ira R., Jr.: *See*—
Morse, Walter H.; and Ames, Ira R., Jr., Re. 29,791, Cl. 188-181.00A.

Fulk, James B., to Paper Converting Machine Company. Method of producing web units. Re. 29,794, Cl. 270-52.500.

Jacobs Manufacturing Company, The: *See*—
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108 4,118,221
134 V 4,118,222
171 4,118,223
4,118,224
204 4,117,565
207 4,118,225

CLASS 76

86 4,117,748

CLASS 81

9.5 R 4,117,749

CLASS 82

30 4,117,750

CLASS 83

58 4,117,752
143 4,117,753
307.2 4,117,754
435.1 4,117,755
801 4,117,756
868 4,117,751

CLASS 84

1.01 4,117,757
4,117,758
1.03 4,117,759

CLASS 89

33 C 4,117,760
129 B 4,117,761

CLASS 90

11 F 4,117,762
13.05 4,117,763
15.1 4,117,913

CLASS 91

50 4,117,764
170 R 4,117,769
361 4,117,765
457 4,117,766
461 4,117,767
499 4,117,768

CLASS 92

57 4,117,770

CLASS 93

93 HT 4,117,771

CLASS 96

17 4,118,228
27 H 4,118,229
27 R 4,118,230
87 A 4,118,231
99 4,118,232
115 P 4,118,233

CLASS 98

2 4,117,772
115 VM 4,117,773

CLASS 99

568 4,117,774

CLASS 100

19 R 4,117,775
117 4,117,776
215 4,117,777

CLASS 101

1 4,117,778
120 4,117,779

CLASS 102

22 R 4,117,780

CLASS 106

1.23 4,118,234
38.22 4,118,235
39.6 4,118,237
47 Q 4,118,238
50 4,118,239
71 4,118,236
73.33 4,118,240
90 4,118,241
98 4,118,242
109 4,118,243
270 4,118,244
288 B 4,118,245
4,118,246
306 4,118,227
308 N 4,118,247

CLASS 108

11 4,117,781
27 4,117,782
91 4,117,783
150 4,117,784

CLASS 109

59 T 4,117,785

CLASS 110

229 4,117,786

CLASS 111

2 4,117,787
52 4,117,788

CLASS 112

181 4,117,789
205 4,117,790
222 4,117,791
433 4,117,792

CLASS 113

116 D 4,117,793

CLASS 114

40 4,117,794
68 4,117,795
74 R 4,117,796
91 4,117,797

CLASS 118

4 4,117,798
6 4,117,799
7 4,117,800
20 4,117,801
48 4,117,802
658 4,117,803

CLASS 119

1 4,117,804
5 4,117,805

CLASS 122

33 4,117,806

CLASS 123

1 R 4,117,810
32 EE 4,117,807
75 B 4,117,808
98 4,117,809
103 R 4,117,811
117 A 4,117,812
119 A 4,117,814
4,117,816
119 EC 4,117,815
119 R 4,117,813
136 4,117,817
148 E 4,117,818
4,117,819
4,117,820
179 L 4,117,821
198 DB 4,117,822
198 E 4,117,823

CLASS 126

15 R 4,117,824
29 4,117,825
65 4,117,826
121 4,117,827
270 4,117,828
4,117,829
271 4,117,830
4,117,831
4,117,832
299 D 4,117,833

CLASS 127

19 4,118,248

CLASS 128

2 S 4,117,834
2.05 M 4,117,835
2.05 R 4,117,836
76 B 4,117,837
130 4,117,838
4,117,839
134 4,117,840
155 4,117,841
163 4,117,842
230 4,117,843
266 4,117,844
284 Re.29,789
295 4,117,845
303.13 4,117,846
348 4,117,847
419 PT 4,117,848

CLASS 130

27 Q 4,117,849

CLASS 131

2 4,117,850
84 B 4,117,851
96 4,117,852

CLASS 132

7 4,117,853
75.8 4,117,854

CLASS 134

141 4,117,855

CLASS 136

89 PC 4,118,249

CLASS 137

62 4,117,856
117 4,117,857
119 4,117,858
219 4,117,859
513.5 4,117,860
595 4,117,861
596.13 4,117,862
601 4,117,863
625.23 4,117,864
627.5 4,117,865

CLASS 138

30 4,117,866
119 4,117,867
146 4,117,868

CLASS 139

1 R 4,117,869
370.2 4,117,870
429 4,117,871

CLASS 140

57 4,117,872
105 4,117,873

CLASS 148

1.5 4,118,250
4,118,251
6.15 R 4,118,253
6.3 4,118,252
32 4,118,254
111 4,118,255
160 4,118,256
187 4,118,257

CLASS 150

1.7 4,117,874
52 R 4,117,875

CLASS 156

60 4,118,258
73.1 4,118,259

85 4,118,260
145 4,118,261
175 4,118,262
197 4,118,263
238 4,118,264
242 4,118,265
293 4,118,266
4,118,267
510 4,118,268
560 4,118,269
659 4,118,270

CLASS 160

67 4,117,876

CLASS 162

31 4,118,271
156 4,118,272
171 4,118,273

CLASS 164

95 4,117,877
292 4,117,878
412 4,117,879
433 4,117,880

CLASS 165

1 Re.29,790
2 4,117,881
104 S 4,117,882
174 4,117,883
175 4,117,884
176 4,117,885

CLASS 166

259 4,117,886

CLASS 169

37 4,117,887

CLASS 172

1 4,117,888
26 4,117,889
40 4,117,890
105 4,117,891
311 4,117,892
4,117,893

CLASS 173

23 4,117,894

CLASS 174

26 R 4,118,593
68.5 4,118,595
87 4,118,596

CLASS 175

53 4,117,895
84 4,117,896
106 4,117,897

CLASS 176

1 4,118,274
36 R 4,118,275
60 4,118,276
87 4,118,277
4,118,278

CLASS 177

165 4,117,898

CLASS 179

1 D 4,118,600
4,118,601
1 G 4,118,599
6 R 4,118,602
16 E 4,118,603
18 FA 4,118,597
107 FD 4,118,604
115.5 VC 4,118,605
156 A 4,118,606

CLASS 180

6.48 4,117,899
7 R 4,117,900
51 4,117,901
54 R 4,117,902
105 E 4,117,903
108 4,117,904
139 4,117,905
4,117,906

CLASS 184

6.2 4,117,907

CLASS 187

20 4,117,908

CLASS 188

2 A 4,117,909
71.9 4,117,910
73.3 4,117,911
181 A Re.29,791
216 4,117,912

CLASS 190

58 R 4,117,914

CLASS 192

98 4,117,916
4,117,917
103 A 4,117,919
103 B 4,117,918

CLASS 195

63 4,118,279
127 4,118,280

CLASS 198

311 4,117,920
482 4,117,921
652 4,117,922
790 4,117,923

CLASS 200

50 A 4,118,607
56 R 4,118,608
67 A 4,118,611
67 DA 4,118,609
4,118,610
81.9 R 4,118,612
82 B 4,118,613
157 4,118,614
4,118,615

CLASS 201

2.5 4,118,281
4,118,282

CLASS 202

160 4,118,283
248 4,118,284

CLASS 203

81 4,118,285
89 4,118,286

CLASS 204

6 4,118,287
11 4,118,288
43 S 4,118,289
59 F 4,118,290
64 T 4,118,291
67 4,118,292
93 4,118,293
129 4,118,294
151 4,118,295
157.1 R 4,118,296
159.11 4,118,297
159.23 4,118,298
180 P 4,118,299
195 T 4,118,300
202 4,118,301
206 4,118,302
224 R 4,118,303
243 R 4,118,304
265 4,118,305
268 4,118,307
284 4,118,306
296 4,118,308

CLASS 206

45.14 4,117,924
186 4,117,925
306 4,117,926
319 4,117,927
320 4,117,928
326 4,117,929
382 4,117,930
387 4,117,931
4,118,616
419 4,117,932
583 4,117,933
610 4,117,934

CLASS 208

11 R 4,118,309
210 4,118,310

CLASS 209

75 4,118,311
166 4,118,312
583 Re.29,792
586 4,117,935

CLASS 210

22 C 4,118,314
23 F 4,118,315
31 C 4,118,316
32 4,118,317
51 4,118,319
58 4,118,318
80 4,118,320
91 4,118,321
136 4,118,322
439 4,118,323

CLASS 211

50 4,117,936
60 T 4,117,937
191 4,117,938

CLASS 214

1 HH 4,117,940
1 SW 4,117,939
2.5 4,117,941
6 B 4,117,942
6 D 4,117,943
131 A 4,117,944

CLASS 215

216 4,117,945
321 4,117,946

CLASS 219

10.61 R 4,118,617
121 L 4,118,619
121 P 4,118,618
124.32 4,118,620

CLASS 220

304 4,117,949
306 4,117,950
410 4,117,948
435 4,117,947
461 4,117,951

CLASS 221

5 4,117,952
211 4,117,953
288 4,117,956

CLASS 222

3 4,118,691
134 4,117,954
144.5 4,117,955
153 Re.29,793
215 4,118,195
321 4,117,957
402.18 4,117,958
590 4,117,959

CLASS 223

94 4,117,960
111 4,117,961

CLASS 224

31 4,117,962
42.1 B 4,117,963
42.1 E 4,117,964
48 R 4,117,965

CLASS 228

2.5 4,117,966
20 4,117,967
124 4,117,968
140 4,117,969
173 A 4,117,970

CLASS 229

1.5 B 4,117,971
28 R 4,117,972

CLASS 235

61 B 4,117,973
304 4,117,974
494 4,117,975

CLASS 236

48 R 4,117,976

CLASS 238

8 4,117,977

CLASS 239

112 4,117,978
381 4,117,979

CLASS 241

37.5 4,117,980
46.15 4,117,981
51 4,117,982
55 4,117,983
73 4,117,984
197 4,117,985

CLASS 242

56.2 4,117,986
71.2 4,117,987
71.9 4,117,988
78.8 4,117,989
84.52 A 4,117,990
86 4,117,991

CLASS 244

23 C 4,117,992
145 4,117,993
152 4,117,994
207 4,117,995
212 4,117,996

CLASS 248

20 4,117,997
56 4,117,998
188.2 4,117,999
228 4,118,000
308 4,118,001
311.1 R 4,118,002
539 4,118,003

CLASS 249

50 4,118,004

CLASS 250

214 A 4,118,621
216 4,118,622
253 4,118,623
326 4,118,624
343 4,118,625
370 4,118,626
397 4,118,627
445 T 4,118,628
4,118,629
492 A 4,118,630
492 R 4,118,631
513 4,118,632
551 4,118,633
577 4,118,634

CLASS 251

75 4,118,005
149.6 4,118,006
223 4,118,007
298 4,118,008
315 4,118,009

CLASS 252

8.1 4,118,325
8.6 4,118,326
8.8 4,118,327
8.9 4,118,324
32.5 4,118,328
4,118,329
4,118,330
32.7 E 4,118,331
107 4,118,332
135 4,118,333
182.1 4,118,334
299 4,118,335
316 4,118,336
417 4,118,337
4,118,338
4,118,339
428 4,118,340
438 4,118,341
439 4,118,342
522 4,118,343
559 4,118,344

CLASS 254

124 4,118,010
4,118,011
173 R 4,118,012
187.5 4,118,013

CLASS 256

1 4,118,014

CLASS 260

2.3 4,118,345
4,118,346
4 AR 4,118,348
8 4,118,349
15 4,118,350
18 N 4,118,351
23 XA 4,118,352
28.5 B 4,118,353
29.2 TN 4,118,354
29.6 PT 4,118,355
29.6 RB 4,118,356
29.6 WA 4,118,357
30.8 R 4,118,358
4,118,359
31.2 R 4,118,360
31.8 G 4,118,361
32.6 A 4,118,362
33.2 R 4,118,363
37 N 4,118,364
39 R 4,118,365
40 R 4,118,366
42.37 4,118,367
45.75 S 4,118,371
45.75 W 4,118,370
45.8 N 4,118,368
4,118,369
112 B 4,118,379
112.5 S 4,118,380
148 4,118,381
154 4,118,382
156 4,118,383
163 4,118,384
175 4,118,385
239.3 T 4,118,386
281 A 4,118,387
290 R 4,118,388
294.8 R 4,118,389
306.8 R 4,118,390
314.5 4,118,391
326 N 4,118,392
326.28 4,118,394
326.29 4,118,395
326.41 4,118,397
326.43 4,118,396
326.5 B 4,118,393
333 4,118,401
340.2 4,118,399
340.5 4,118,400
340.6 4,118,398
346.75 4,118,402
346.76 4,118,403
404 4,118,404
405 4,118,405
410.9 R 4,118,406
412.5 4,118,407
439 R 4,118,408
448 A 4,118,409
453 AM 4,118,410
453 SP 4,118,411
464 4,118,412
465 D 4,118,413
467 4,118,414
544 F 4,118,421
561 A 4,118,422
584 A 4,118,423
613 R 4,118,424
614 A 4,118,425
615 B 4,118,426
663 4,118,428
668 A 4,118,430
668 R 4,118,431
4,118,434
674 SA 4,118,429
683.15 D 4,118,432
683.51 4,118,433
826 4,118,436
834 4,118,437
857 L 4,118,438
858 4,118,439
873 4,118,440
874 4,118,441
885 4,118,442
972 4,118,435
980 4,118,443

CLASS 261

44 A 4,118,444
44 B 4,118,445
114 VT 4,118,446
122 4,118,447

CLASS 264

1 4,118,448
28 4,118,449
43 4,118,450
46.5 4,118,451
89 4,118,452
4,118,453
93 4,118,454
129 4,118,455
177 R 4,118,456

CLASS 266

44 4,118,015
130 4,118,016
187 4,118,017
275 4,118,018

CLASS 267

153 4,118,019
168 4,118,020

CLASS 269

86 4,118,021

CLASS 270

52.5 Re.29,794
4,118,022
54 4,118,023

CLASS 271

5 4,118,024
273 4,118,025

CLASS 273

1 L 4,118,027
1 R 4,118,026
26 A 4,118,028
32 C 4,118,034
73 D 4,118,029
96 R 4,118,030
110 4,118,031
185 C 4,118,032
186 A 4,118,033
243 4,118,035
257 4,118,036

CLASS 274

1 A 4,118,037
9 B 4,118,038
9 RA 4,118,039

CLASS 277

75 4,118,040
180 4,118,041
226 4,118,042

CLASS 280

8 4,118,043
33.99 F 4,118,044
47.35 4,118,048
255 4,117,915
283 4,118,045
289 WC 4,118,046
402 4,118,047
483 4,118,049
604 4,118,050
610 4,118,051
642 4,118,052
747 4,118,053
765 4,118,054

CLASS 290

40 R 4,118,635
52 4,118,636
55 4,118,637

CLASS 292

165 4,118,055
169.17 4,118,056
307 R 4,118,057

CLASS 294

67 B 4,118,058
74 4,118,059
83 R 4,118,060

CLASS 296

63 4,118,061
4,118,062
137 B 4,118,063

CLASS 297

18 4,118,064
45 4,118,065
184 4,118,066
379 4,118,067
385 4,118,068
416 4,118,069

CLASS 299

2 4,118,070
4,118,071
43 4,118,072

CLASS 301

6 CS 4,118,073

CLASS 302

26 4,118,074
53 4,118,075

CLASS 303

6 C 4,118,076
4,118,077

CLASS 307

11 4,118,638
147 4,118,639
237 4,118,640
238 4,118,642
240 4,118,641

CLASS 308

6 C 4,118,078
4,118,101
9 4,118,079
187.1 4,118,080

CLASS 310

11 4,118,643
42 4,118,644
53 4,118,645
58 4,118,646
239 4,118,647
269 4,118,648
337 4,118,649

CLASS 312

8 4,118,081
59 4,118,082
100 4,118,083
107 4,118,084
245 4,118,085
270 4,118,086
291 4,118,087
350 4,118,088
351 4,118,089

CLASS 313

422 4,118,650
4,118,651

CLASS 315

5.41 4,118,652
4,118,653
371 4,118,655
4,118,656
408 4,118,657

CLASS 318

257 4,118,658
560 4,118,659
571 4,118,660

CLASS 320

40 4,118,661

CLASS 324

3 4,118,662
30 R 4,118,663
51 4,118,664
57 R 4,118,665
77 C 4,118,666
110 4,118,667

CLASS 325

26 4,118,598
67 4,118,668
309 4,118,669

446 4,118,670

CLASS 330

43 4,118,671
286 4,118,672

CLASS 331

2 4,118,673
17 4,118,674
94.5 C 4,118,675

CLASS 332

7.51 4,118,676
9 R 4,118,677

CLASS 333

70 S 4,118,678

CLASS 334

1 4,118,679

CLASS 335

176 4,118,680
195 4,118,681

CLASS 337

34 4,118,682
91 4,118,683
296 4,118,684

CLASS 339

12 R 4,118,090
14 R 4,118,091
17 F 4,118,102
59 M 4,118,092
75 M 4,118,093
75 MP 4,118,094
98 4,118,103
99 R 4,118,095
4,118,096
232 4,118,097
263 R 4,118,098

CLASS 340

146.1 AB 4,118,686
146.3 ED 4,118,687
146.3 P 4,118,685
293 4,118,694
324 AD 4,118,695
347 C 4,118,697
347 CC 4,118,698
347 DA 4,118,699
347 NT 4,118,696
516 4,118,688
524 4,118,700
542 4,118,692
572 4,118,693
629 4,118,689
656 4,118,690

CLASS 343

6 R 4,118,701
7 PF 4,118,702
17.2 R 4,118,703
18 A 4,118,704
100 AD 4,118,705
700 MS 4,118,706
765 4,118,707
901 4,118,708

CLASS 346

33 R 4,118,709
153 4,118,710

CLASS 350

3.6 4,118,104
3.73 4,118,099
96.20 4,118,100
4,118,105
96.23 4,118,594
96.25 4,118,106
162 SF 4,118,107
184 4,118,108
285 4,118,109
334 4,118,110

4,118,111
351 4,118,112
358 4,118,113

CLASS 352

130 4,118,737

CLASS 353

38 4,118,114

CLASS 354

15 4,118,711
23 D 4,118,712
4,118,713
31 4,118,714
33 4,118,715
38 4,118,716
43 4,118,717
55 4,118,718
79 4,118,719
81 4,118,720
147 4,118,721
155 4,118,722
4,118,723
266 4,118,724
289 4,118,725
4,118,726

CLASS 355

3 DD 4,118,115
3 R 4,118,116
8 4,118,117
4,118,118
11 4,118,119
75 4,118,120
4,118,121
77 4,118,122
78 4,118,123

CLASS 356

107 4,118,124
116 4,118,125
123 4,118,126
200 4,118,127

CLASS 357

10 4,118,727
22 4,118,728

CLASS 358

10 4,118,729
28 4,118,741
65 4,118,731
93 4,118,730
101 4,118,732
109 4,118,733
128 4,118,734
4,118,735
4,118,736
148 4,118,738
190 4,118,739
195 4,118,740

CLASS 360

73 4,118,743
74 4,118,744
96 4,118,745
99 4,118,746
121 4,118,747
133 4,118,748

CLASS 361

33 4,118,749
182 4,118,750
220 4,118,751
232 4,118,752
331 4,118,753
355 4,118,754
379 4,118,755
385 4,118,756
404 4,118,757

CLASS 362

6 4,118,758

98 4,118,759
239 4,118,760
297 4,118,761
311 4,118,762
339 4,118,763
369 4,118,764
384 4,118,765
427 4,118,766
455 4,118,767

CLASS 363

54 4,118,769
85 4,118,768
138 4,118,770

CLASS 364

101 4,118,771
119 4,118,772
200 4,118,773
431 4,118,774
467 4,118,775
474 4,118,776
475 4,118,777
502 4,118,778
509 4,118,779
510 4,118,780
525 4,118,781
565 4,118,782
724 4,118,784
734 4,118,783
754 4,118,785
783 4,118,786
842 4,118,787
900 4,118,788
4,118,789
4,118,790
4,118,791
4,118,792

CLASS 365

30 4,118,793
149 4,118,794
222 4,118,795

CLASS 366

111 4,118,801
124 4,118,796
127 4,118,797
156 4,118,798
161 4,118,799
341 4,118,800

CLASS 400

118 4,118,128
144.2 4,118,129

CLASS 401

2 4,118,130

CLASS 403

24 4,118,131
4,118,132
4,118,133
282 4,118,134
361 4,118,135
386 4,118,136

CLASS 404

76 4,118,137

CLASS 405

36 4,117,685
54 4,117,684
61 4,117,683
163 4,117,689
166 4,117,692
171 4,117,693
188 4,117,688
205 4,117,691
227 4,117,690
284 4,117,686
292 4,117,687

CLASS 407

112 4,118,138

CLASS 408

12 4,118,139
59 4,118,140
90 4,118,141

CLASS 415

69 4,118,142

CLASS 416

18 4,118,143
41 4,118,144
96 R 4,118,145
97 A 4,118,146
230 4,118,147

CLASS 417

12 4,118,148
26 4,118,149
40 4,118,150
223 4,118,151
254 4,118,152
363 4,118,153
402 4,118,154
462 4,118,155
494 4,118,156

CLASS 418

1 4,118,157
54 4,118,158
153 4,118,159
260 4,118,160

CLASS 422

94 4,118,193
98 4,118,194
171 4,118,199
173 4,118,198
232 4,118,196
246 4,118,197

CLASS 423

7 4,118,457
53 4,119,696
109 4,118,458
142 4,118,459
235 4,118,460
321 S 4,118,462
334 4,118,463
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	137	249,765
	140	249,766
	143	249,767
	191	249,768
D7—	38	249,769
	39	249,770
D8—	8	249,771
D9—	64	249,773
	185	249,774
	25	249,809
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	106	249,778
D11—	12	249,779
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	81	249,781
	166	249,782
D12—	181	249,783
	182	249,784
	185	249,785
	196	249,786
	205	249,787
D13—	3	249,788
	24	249,789
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D22—	1	249,800
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PATENTS WERE ISSUED ON THE 12TH DAY OF SEPTEMBER, 1978

The List of Patentees published in the September 12, 1978 Official Gazette erroneously listed Application Serial Numbers preceded by the letter "B" instead of Patent Numbers. The corrected List of Patentees to whom patents were issued on the 12th day of September, 1978 is reprinted here in its entirety.

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Haarhoff, Pierre Cloete; and Schumann, Werner Adolf, 4,113,448, Cl. 55-17.000.
Atwood, Gilbert Richard, to Union Carbide Corporation. Recovering sulfur from gas streams containing hydrogen sulfide. 4,113,849, Cl. 423-574.00R.
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aus der Funten, Helmut; and Vogt, Wilhelm, to Dynamit Nobel Aktiengesellschaft. Method of preparing phthalide. 4,113,741, Cl. 260-343.30R.
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for producing large-size substrate-based semiconductor material utilizing vapor-phase deposition and subsequent resolidification. 4,113,532, Cl. 148-174.000.
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Aya, Masayoshi; and Hiya, Kohji, to Matsushita Electric Industrial Co., Ltd. Convergence apparatus with variably magnetized magnets. 4,114,124, Cl. 335-212.000.
Ayers, Robert Lee; and Hamaker, Raymond Weaver, to International Business Machines Corporation. Technique for preventing forward biased epi-isolation degradation. 4,113,512, Cl. 148-1.500.
AZO-Maschinenfabrik Adolf Zimmermann: *See*—
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Bader, Hartmann, to Sulzer Brothers Limited. Loom harness. 4,112,980, Cl. 139-92.000.
Badran, Nasri W., to Badran, Nasri W. Microcrystalline 3-(alpha-acetonylbenzyl)-4-hydroxycoumarin (warfarin) and methods of making. 4,113,744, Cl. 260-343.440.
Baggaley, Keith Howard, to Beecham Group Limited. 2-Substituted benzisothiazolones. 4,113,728, Cl. 260-283.00S.
Bagnall, Robert David, to Imperial Chemical Industries Limited. Anaesthetic compositions. 4,113,883, Cl. 424-342.000.
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Ballas, George C.; and Mitchell, Albert W., to Weed Eater, Inc. Lawn mower and method. 4,112,653, Cl. 56-12.700.
Ballentine, Earle W. Gas broiler. 4,112,912, Cl. 126-41.00R.
Balme, Maurice; and Gruffaz, Max, to Rhone-Poulenc S.A. Polyamines with imide groups. 4,113,737, Cl. 260-326.260.
Balukin, Richard F., to Westinghouse Air Brake Company. Brake valve device. 4,113,320, Cl. 303-54.000.
Balzer, Claude P., to Balco, Inc. Stair nosing structure. 4,112,641, Cl. 52-179.000.
Banks, Benjamin W. Liquid proportioner for pressure feed line. 4,112,964, Cl. 137-205.500.
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Barecki, Chester J., to American Seating Company. Wheelchair retainer mechanism. 4,113,270, Cl. 280-179.00R.
Barlow, Harold Everard Monteagle, to National Research Development Corporation. Apparatus and methods for launching and screening electromagnetic waves in the dipole mode. 4,114,121, Cl. 333-95.00R.
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Barzynski, Helmut; and Heil, Guenter, to BASF Aktiengesellschaft. Benzophenone-containing photopolymerizable binders for printing inks and coating compositions. 4,113,593, Cl. 204-159.150.

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Fischer, Adolf, deceased; and Hamprecht, Gerhard, 4,113,939, Cl. 544-11.000.
Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, 4,113,754, Cl. 260-429.00R.
Opgenorth, Hans-Joachim; and Scheuermann, Horst, 4,113,732, Cl. 260-305.000.
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Bauer, William V., to Lummus Company, The. Two-stage hydrotreating of pyrolysis gasoline to remove mercaptan sulfur and dienes. 4,113,603, Cl. 208-89.000.
Baugh, Benton F. Rotational speed reduction and reversing mechanisms. 4,112,781, Cl. 74-198.000.
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, to Merck Patent Gesellschaft mit beschrankter Haftung. Prostenoic acid derivatives. 4,113,863, Cl. 424-205.000.
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Hugl, Herbert; Schundehutte, Karl Heinz; Trautner, Kersten; and Wolfrum, Gerhard, 4,113,428, Cl. 8-41.00R.
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Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,113,957, Cl. 548-377.000.
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,113,747, Cl. 260-348.250.
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Beckershoff, Wolfgang, to BBC Brown Boveri & Company Limited. Apparatus for positioning coaxial arranged machine parts. 4,112,582, Cl. 33-181.00R.
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Bell, Norman; Andersen, John N.; and Lam, Hung-Kei H., to Kaiser Aluminum & Chemical Corporation. Process for the utilization of waste materials from electrolytic aluminum reduction systems. 4,113,832, Cl. 423-119.000.
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Benac, Bernard Henri Jean; Benac, Jacques Marie Lucien; and Benac, Henri. Beater for a grape harvesting machine, as well as grape harvesting machines provided with such a beater. 4,112,657, Cl. 56-330.000.
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Bliudnikas, Kestutis E., to Alden Research Foundation. Precision track for moving facsimile recording blade. 4,114,165, Cl. 346-139.00C.
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Blount, David H. Process for the production of acrylic compounds and resinous products. 4,113,693, Cl. 528-271.000.
Blumenfeld, Georg; and Vollkommer, Norbert, to Dynamit Nobel Aktiengesellschaft. Unsaturated polyesters derived from chloroxylylene diols. 4,113,703, Cl. 528-299.000.
Bobkov, Lev Nikolaevich: *See*—
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, 4,113,833, Cl. 423-131.000.
Bochan, John, to General Electric Company. Clothes dryer variable speed drive system. 4,112,767, Cl. 74-217.00R.
Bock, Manfred; Pedain, Josef; and Uerdingen, Walter, to Bayer Aktiengesellschaft. Triisocyanates useful for the production of polyurethane resins. 4,113,705, Cl. 260-859.00R.
Bodolay, William A. Hot wire packaging machine. 4,112,652, Cl. 53-211.000.
Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., to Libbey-Owens-Ford Company. Method of and apparatus for thermally severing glass. 4,113,162, Cl. 225-2.000.
Boehringer Ingelheim GmbH: *See*—
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,113,777, Cl. 260-570.900.
Boehringer Mannheim GmbH: *See*—
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Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, to Banyaszati Kutato Intezet; Skotchinksy Institut Gornogo Dela; and Taurus Gumiipari Vallalat. End fitting for multichannel hose. 4,113,287, Cl. 285-137.00R.
Boggs, Daniel Roy: *See*—
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Bolick, Fred C., Jr.; and Titus IV, Theodore, to Lanier Business Products, Inc. Dictation recording and transcribing system utilizing selectable dual message record-playback apparatus. 4,113,994, Cl. 179-100.1DR.
Bolkow Gesellschaft mit beschrankter Haftung: *See*—
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Bom, Cornelis Johannes Gerardus: *See*—
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Bonazoli, Robert P.; and Morgan, William H., Jr., to GTE Sylvania Incorporated. Flashlamp assembly with tapered housing. 4,113,420, Cl. 431-93.000.
Bond, John A., to ACF Industries, Incorporated. Seat structure for gate valves. 4,113,233, Cl. 251-328.000.
Bonnemay, Maurice Gabriel Ernst: *See*—
Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, 4,113,596, Cl. 204-180.00R.
Booty, Donald J., to Feldmar Products, Inc. Mechanical channel selector device. 4,114,098, Cl. 325-390.000.
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Boretos, John W.: *See*—
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Borowick, John Joseph, to United States of America, Army. L-Band radar antenna array. 4,114,163, Cl. 343-815.000.
Bos, Frans, to Saab-Scania AB. Wind deflector. 4,113,302, Cl. 296-137.00J.
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Bost, Pierre-Etienne; and Lartigau, Guy, to Rhone-Poulenc S.A. Preparation of ketones. 4,113,779, Cl. 260-592.000.
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Boucard, Michel Jean, to Societe Industrielle et Financiere le Profil. Cold profiling machine. 4,112,722, Cl. 72-181.000.
Bouquet, Jean-Claude, to Societe d'Etudes de Machines Thermiques. Internal combustion engine fit-up device. 4,112,883, Cl. 123-52.00M.
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., to Delalande S. A. Aminoalkoxybenzofurans. 4,113,951, Cl. 544-360.000.
Bourlet, Maurice V., to Fabrique Nationale Herstal S.A. en abrege FN. Supply device for a portable firearm by means of cartridge belts or by means of rifle magazines using the same ammunition. 4,112,817, Cl. 89-33.00B.
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Bowen, David J.: *See*—
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Bower, Barton Keeley, to Hercules Incorporated. Tetra (bicycloheptyl) transition metal compounds. 4,113,753, Cl. 260-429.500.
Bowker, Donald R.; Klein, Donald J.; and Rados, Stephen E., to Philips Industries Inc. Method of forming a bell end on thermoplastic pipe. 4,113,829, Cl. 264-295.000.
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Boyd, William Weller; Grafe, Robert Joseph; and Pingry, Carl Oscar, III, to International Business Machines Corporation. Security controlled information exchange system. 4,114,139, Cl. 340-147.00R.
Bradley, Edmund G., to Marden Manufacturing Company, Inc. Spot planter. 4,112,857, Cl. 111-3.000.
Bradley, Terrag W., to Supra Products, Inc. Key box. 4,112,717, Cl. 70-63.000.
Brager, Douglas R. Interior-exterior truck body wash. 4,112,533, Cl. 15-53.00A.
Brago, Reacelyn A. Multi-fluid wash system. 4,113,182, Cl. 239-304.000.
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Brandestini, Marco, to Contraves AG. Method and apparatus for determining a change of the flow state of flowable substances from its static state to its flowing state or vice verse. 4,112,740, Cl. 73-53.000.
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Brandt, Paul W., to Brandt, David W. Device for towing rolled bales of hay. 4,113,116, Cl. 214-1.0HA.
Brandwein, Arthur. Tape splicing device and dispenser therefor. 4,113,906, Cl. 428-42.000.
Braulke, Herbert A., III. Combined hot air and steam hair dryer. 4,114,022, Cl. 219-362.000.
Brechbuhl, Heinz, to Maschinenfabrik Kern AG Konolfingen. Cutter apparatus for dividing a form band or the like into individual forms. 4,112,796, Cl. 83-141.000.
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Brentford Electric Limited: *See*—
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Brimm, Daniel J., to Chem-tronics, Inc. Chemical milling process. 4,113,549, Cl. 156-639.000.
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Brito, Teodoro Guzman. Key ring holder. 4,113,156, Cl. 224-5.00R.
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Brockway, Charles E., to Sybron Corporation. Headrest for dental chair. 4,113,309, Cl. 297-408.000.
Brooks, Burton; and Brooks, Richard J., to Chemithon Corporation, The. Sulfonating apparatus. 4,113,438, Cl. 422-193.000.
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Brown, Francis Barton; and Erickson, John W., to Kobe, Inc. Gas/liquid separator. 4,113,452, Cl. 55-203.000.
Brown, Jack E., Jr., to Goodyear Tire & Rubber Company, The. Reduction of lateral force variations of a tire effective in both forward and rearward senses of rotation. 4,112,630, Cl. 51-281.00R.
Brown, Marshall B. Method and apparatus for making pipe flanges. 4,112,727, Cl. 72-142.000.
Brown, Rex M. Combined fireplace hood and heating unit. 4,112,914, Cl. 126-121.000.
Brown, Robert M.; and Karliner, Rudolf R., to Valley Hydro-Luft, Inc. Dispensing gun. 4,113,151, Cl. 222-324.000.
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Budzich, Tadeusz. Load responsive fluid control valves. 4,112,679, Cl. 60-445.000.
Bugge, Hans Jorgen; Strandly, Ingvald; and Swanberg, Carl Olof, to Nordiska Maskinfilt Aktiebolaget. Forming wire for use in papermaking, cellulose and similar machines. 4,112,982, Cl. 139-425.00A.
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Bush, Austin R.; and Ferrarese, Frank L., to Worthington Pump, Inc. Support fixtures for preassembled unit or cartridge for multi-stage barrel type centrifugal pumps. 4,113,089, Cl. 206-319.000.
Bush, Robert F.; and Mitchell, Joseph W., to International Business Machines Corporation. Process for producing magnetic particles by vacuum evaporation of iron with collection on a magnetized surface. 4,113,521, Cl. 148-6.350.
Bushman, Willard T.; and Snyder, Robert C., to Documation Incorporated. Data card reader employing synchronization and resynchronization means. 4,114,031, Cl. 235-474.000.
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Carlson, David H. J., to UOP Inc. Process for treating a sour petroleum distillate with anion exchange resin and with metal phthalocyanine catalyst. 4,113,604, Cl. 208-206.000.
Carlson, David L., to Renco Corporation. Ultrasonic detector with audible indication signal. 4,112,927, Cl. 128-2.00V.
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Carn, Patrick. Navigation harnesses. 4,112,865, Cl. 114-270.000.
Carol, John A., Jr.; and McAlindon, Harold P., to General Motors Corporation. Mileage indicator. 4,114,025, Cl. 235-96.000.
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Carstens, Dennis L., to Becton, Dickinson and Company. Medical instrument package. 4,113,090, Cl. 206-365.000.
Carter, Ian T. Chord locater for stringed musical instruments. 4,112,805, Cl. 84-317.000.
Carter, Michael Charles; and Steer, Philip James, to National Research Development Corporation. Apparatus for indicating uterine activity in labor. 4,114,188, Cl. 364-415.000.
Casalis, Jean-Arnaud; Teil, Yves; and Motte, Raymond, to Societe Miniere et Metallurgique de Penarroya. Flotation apparatus with mechanical agitation. 4,113,624, Cl. 210-219.000.
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Castilla, Antonio Jose. Gun lead sight. 4,112,583, Cl. 33-261.000.
Cataldo, Roy S., to General Motors Corporation. Variable displacement reciprocating piston machine. 4,112,826, Cl. 92-13.100.
Catallo, Frank. Method of padding and extracting a continuously advancing circular knit fabric tube. 4,112,532, Cl. 8-151.000.
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Cavalier, Jean-Claude: *See—*
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Cavalleri, Bruno; and Volpe, Giancarlo, to Gruppo Lepetit S.p.A. 2-Nitroimidazole derivatives. 4,113,953, Cl. 548-339.000.
Cavitron Corporation: *See—*
Burns, Henry L., 4,112,931, Cl. 128-2.080.
Cebal: *See—*
Berthet, Andre, 4,113,133, Cl. 220-74.000.
Cecchini, Jack. Stringed musical instrument. 4,112,804, Cl. 84-173.000.
Celanese Corporation: *See—*
Kalnin, Ilmar L.; and Breckenridge, George J., 4,113,683, Cl. 260-857.0TW.
Patella, Ralph F.; and Kuzma, Edward J., 4,113,540, Cl. 156-327.000.
Rybny, Charles B.; Trebellas, John C.; and Sargent, Donald E., 4,113,592, Cl. 204-159.160.
Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie: *See—*
Pirlet, Robert Alfred, 4,112,763, Cl. 73-355.00R.
Cesca, Sebastiano; Priola, Aldo; and Ferraris, Giuseppe, to Snam Progetti, S.p.A. Process for the preparation of linear alpha-olefin oligomers, subsequent hydrogenation thereof and saturated products thus obtained. 4,113,790, Cl. 260-683.15B.
Cesca, Sebastiano: *See—*
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, 4,113,694, Cl. 260-875.000.
CF Industries, Inc.: *See—*
Loughrie, Gregory D., 4,113,184, Cl. 241-15.000.
Chadwick-Helmuth Company, Inc.: *See—*
Chadwick, James R., 4,112,774, Cl. 73-455.000.
Chadwick, James R., to Chadwick-Helmuth Company, Inc. Aircraft rotor out-of-track correction method and apparatus. 4,112,774, Cl. 73-455.000.
Chambers, Norman T.: *See—*
Glaudel, Stephen P.; and Chambers, Norman T., 4,114,084, Cl. 322-38.000.
Chambley, Phillip W.: *See—*
Norris, Alan H.; and Chambley, Phillip W., 4,112,561, Cl. 28-243.000.
Champion International Corporation: *See—*
Hartman, Seymour, 4,113,919, Cl. 428-529.000.
Norris, Alan H.; and Chambley, Phillip W., 4,112,561, Cl. 28-243.000.
Wright, John T., 4,113,079, Cl. 192-129.00B.
Champion Spark Plug Company: *See—*
Abair, Raymond L.; and Kulish, Stanley J., Jr., 4,113,809, Cl. 261-81.000.
Champlin, Harry C., Jr.: *See—*
Simmons, Kenneth C.; Champlin, Harry C., Jr.; Livorsi, Carl F.; and Wucik, Joseph A., Jr., 4,113,268, Cl. 277-168.000.
Chandley, George D., to Hitchiner Manufacturing Co., Inc. Metal casting. 4,112,997, Cl. 164-119.000.
Chang, Nuke Ming; Remkes, Elmer R.; and Cook, William, Jr., to Santa Fe International Corp. Sea sled for entrenching pipe. 4,112,695, Cl. 405-163.000.
Chapin, Leonard Lee; and Merrick, James Walter, to Autotronic Controls, Corp. Fuel system with metering pump for internal combustion engines. 4,112,901, Cl. 123-139.00E.
Chapman, Richard D.; Holmer, Donald A.; and Mortimer, George A., to Monsanto Company. Melt preparation of 6TA/6IA polymers with phosphorus compound to reduce ammonia formation. 4,113,708, Cl. 528-313.000.
Charlson, David V.: *See—*
Anderson, Leroy E.; Charlson, David V.; and Vierkant, Mark A., 4,112,731, Cl. 72-320.000.
Chateau, Louis Jean, to Ducellier et Co. Automatic spark timing device. 4,112,887, Cl. 123-117.00D.
Chatterjee, Pallab K.: *See—*
Fu, Horng-sen; Holloway, Thomas C.; Tasch, Al F., Jr.; and Chatterjee, Pallab K., 4,112,575, Cl. 29-577.00C.
Chem-tronics, Inc.: *See—*
Brimm, Daniel J., 4,113,549, Cl. 156-639.000.
Chemische Fabrik Stockhausen & Cie: *See—*
Hubner, Wolfgang; Barthell, Eduard; and Dahmen, Kurt, 4,113,685, Cl. 260-29.4UA.
Chemithon Corporation, The: *See—*
Brooks, Burton; and Brooks, Richard J., 4,113,438, Cl. 422-193.000.
ChemPar Corporation: *See—*
Kang, Pierson S., 4,112,827, Cl. 93-58.300.
Chen, Kon S.; and Majewski, Helmut W., to Stauffer Chemical Company. Disposal of heavy metal containing sludge wastes. 4,113,504, Cl. 106-97.000.
Cheron, Jacques, to Institut Francais du Petrole. Fuel cell including at least one improved element. 4,113,923, Cl. 429-36.000.
Chevron Research Company: *See—*
Kurkov, Victor P., 4,113,735, Cl. 260-326.5FL.
Miller, Stephen J., 4,113,607, Cl. 208-254.00R.
Mulaskey, Bernard F., 4,113,606, Cl. 208-244.000.
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,113,525, Cl. 148-23.000.
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,113,526, Cl. 148-23.000.
Tamm, Paul Whitfield, 4,113,661, Cl. 252-465.000.
Wall, Robert G., 4,113,662, Cl. 252-473.000.
Chiaramonte, Gasper, Jr. Dynamically illuminated footwear. 4,112,601, Cl. 36-137.000.
Chicago Fire Brick Company: *See—*
Rechter, Harold L., 4,113,502, Cl. 106-67.000.
Chikamori, Kunio, to Agency of Industrial Science and Technology. Method for electrochemical machining. 4,113,587, Cl. 204-129.100.
Childers, Aubrey C.: *See—*
Malinski, Richard F.; and Childers, Aubrey C., 4,114,078, Cl. 318-475.000.
Children's Memorial Hospital, The: *See—*
Schulman, Jerome L.; and Kaplan, Jay, 4,112,926, Cl. 128-2.00S.
Chinery, Jack Joseph, to RCA Corporation. Method of testing semiconductor devices. 4,114,096, Cl. 324-158.00D.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See—*
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, 4,113,868, Cl. 424-251.000.
Chiulli, Robert D. Laparoscopic cannula. 4,112,932, Cl. 128-3.000.
Chiulli, Robert D. Radiographic cassette adapter. 4,114,044, Cl. 250-468.000.
Chloride Group Limited: *See—*
McBrien, Roderick Julian, 4,113,926, Cl. 429-99.000.
Choay S.A.: *See—*
Estevenel, Yvette Fr. M. J.; Thely, Maurice H.; and Coulon, Wladimir A., 4,113,816, Cl. 264-113.000.
Choinski, Edward J., to Polaroid Corporation. Method of multilayer coating. 4,113,903, Cl. 427-420.000.
Chornet, Esteban; and Cavalier, Jean-Claude, to Universite de Sherbrooke. Manufacture of a metal impregnated carbon from peat material. 4,113,651, Cl. 252-422.000.
Chow, Philip Y., to Lin Offshore Engineering, Inc. Method of producing and installing offshore structures. 4,112,697, Cl. 405-209.000.
Christian, Donald K. Fabric bulking process. 4,112,558, Cl. 26-18.500.
Christy, Mark H.; and Spencer, Lloyd. Flush-drip irrigation emitter. 4,113,180, Cl. 239-109.000.
Chrtek, Milan; Gabler, Josef; Tuma, Frantisek; Kasparek, Karel; and Blasko, Jan, to Vyzkumny ustav bavlnarsky. Method of and apparatus for cooling spinning units of open-end spinning machines. 4,112,663, Cl. 57-58.890.
Chulkova, Anna Davydovna: *See—*
Ivanov, Valentin Nikolaevich; and Chulkova, Anna Davydovna, 4,113,499, Cl. 106-38.350.
Ciba-Geigy Corporation: *See—*
Deiner, Hans; Mosch, Franz; and Bernheim, Willy, 4,113,947, Cl. 544-196.000.
Loew, Peter; and Koller, Stefan, 4,113,718, Cl. 260-147.000.
Siegrist, Adolf Emil; and Pauchard, Jean-Paul, 4,113,937, Cl. 542-463.000.
Siegrist, Adolf Emil; and de Sousa, Bernardo, 4,113,938, Cl. 542-464.000.
Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, 4,113,669, Cl. 521-108.000.
Cigliano, Irving Louis, to Marine Moisture Control Co., Inc. Cam lock with vertical plunger. 4,113,227, Cl. 151-54.000.
Cimarusti, Christopher M.: *See—*
Varma, Ravi K.; and Cimarusti, Christopher M., 4,113,722, Cl. 260-239.55R.
Cimarusti, Christopher Michael: *See—*
Hauck, Frederic Peter; and Cimarusti, Christopher Michael, 4,113,726, Cl. 544-380.000.
Cincinnati Electronics Corporation: *See—*
Raab, Frederick Herbert, 4,114,155, Cl. 343-105.00R.
Cincinnati Milacron-Heald Corp.: *See—*
Uhtenwoldt, Herbert R.; and Humes, Norman S., 4,112,624, Cl. 51-5.00D.
Citizen Watch Co., Ltd.: *See—*
Kato, Yoshiaki; and Motoki, Jinro, 4,112,671, Cl. 58-23.00D.
Claesson, Harry; and Hellgren, Keijo, to ASEA Aktiebolag. Transportation units for supporting and moving plate-formed attachment member into and out of a press stand of hydraulic press. 4,112,724, Cl. 72-63.000.
Clairol, Inc.: *See—*
Walter, Henry J., 4,114,194, Cl. 366-111.000.
Clapp, Porter B. Two-piece tube plug for repairing tubes in heat exchangers and the like. 4,113,006, Cl. 165-76.000.
Clark, Arthur E.: *See—*
Hudson, George Elbert, III; and Clark, Arthur E., 4,112,699, Cl. 62-3.000.
Clark, George M. Drilling jar. 4,113,038, Cl. 175-300.000.
Clark, James A.; Livesey, Donald V.; and Wrue, Richard J., to Bausch & Lomb Incorporated. Apparatus for forming optical lenses. 4,113,224, Cl. 249-105.000.
Clark, John A.: *See—*
Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., 4,112,952, Cl. 128-418.000.
Clark, Judith Ann, to Beecham Group Limited. Esters of derivatives of 1,1-diphenyl-3-amino-propan-2-ol. 4,113,972, Cl. 560-250.000.
Clark, Steven D.: *See—*
Benham, Harold L.; Clark, Steven D.; Huffman, Hubert L.; and Stovall, Ronald J., 4,114,083, Cl. 320-39.000.
Clarke, Michael R.; and Dolenko, Allan J., to Canadian Patents and Development Limited. Methylolated kraft lignin polymer resin. 4,113,675, Cl. 260-17.500.
Clelland, John J. Pre-cast insulated wall structure. 4,112,646, Cl. 52-372.000.
Clemens, George Selden: *See—*
Hulka, Jaroslav Fabian; and Clemens, George Selden, 4,112,951, Cl. 128-346.000.

Clement, Clyde H. Vehicle top loading mechanism. 4,113,127, Cl. 214-450.000.

Clement, George Frederick; and Sniegowski, Bruno Raymond, to Bell Telephone Laboratories, Incorporated; and Western Electric Company. Telephone controlled lock release arrangement. 4,113,986, Cl. 179-2.00A.

Climet Instruments Company: *See—*
Lepper, James M., Jr., 4,113,386, Cl. 356-103.000.

Clokey, Arthur C. Reinforced articles of elastomeric material. 4,112,614, Cl. 46-151.000.

Cluett, Peabody & Co., Inc.: *See—*
Troope, Walter S.; and Lawrence, Jackson, 4,112,559, Cl. 26-18.600.

Coates, David; Gray, George William; and McDonnell, Damien Gerard, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystalline materials. 4,113,647, Cl. 252-299.000.

Cohen, Choua; and Sillion, Bernard, to Institut Francais du Petrole. Alkyl-guanidino-heterocyclic compounds, their manufacture and use as additives for fuels and lubricants. 4,113,637, Cl. 252-51.50A.

Cohen, Michael Robert; Kierstead, Richard Wightman; and Tilley, Jefferson Wright, to Hoffmann-La Roche Inc. 1-(2-Aminoethyl)-3-(2,6-dihalophenyl)guanidines. 4,113,776, Cl. 260-565.000.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Synthesis of optically active vitamin E. 4,113,740, Cl. 260-340.90R.

Cohu, Inc.: *See—*
Wind, Walter Jamison, 4,113,137, Cl. 220-319.000.

Cola, Rudolph A.: *See—*
Maloney, Thomas C.; and Cola, Rudolph A., 4,114,148, Cl. 340-343.000.

Colburn, John W., Jr.: *See—*
Melton, Rosser B., Jr.; Colburn, John W., Jr.; and Wood, Charles D., III, 4,113,315, Cl. 299-13.000.

Colby, Donald B., to Scott Paper Company. Foldable furniture unit. 4,112,855, Cl. 108-159.000.

Cole, Carroll Richard, to Caterpillar Tractor Co. Motor grader with draw bar and circle support structure. 4,113,032, Cl. 172-781.000.

Cole, Lawrence S.; Cole, Ruth J.; and Facchini, Rigo. Apparatus for successively dispensing from a can of a jellied product slices of a cross sectional area less than that of the can. 4,112,800, Cl. 83-411.00A.

Cole, Martin; Hood, John Dick; and Butterworth, Dennis, to Beecham Group Limited. Antibiotic mm 13902. 4,113,856, Cl. 424-117.000.

Cole, Ruth J.: *See—*
Cole, Lawrence S.; Cole, Ruth J.; and Facchini, Rigo, 4,112,800, Cl. 83-411.00A.

Colgate-Palmolive Company: *See—*
Carson, John C., Jr.; Robbins, Clarence R.; and Kenkare, Divaker B., 4,112,536, Cl. 15-104.940.
Kenkare, Divaker B.; and Shumway, Durland K., 4,113,852, Cl. 424-46.000.

Colglazier, Donald Francis; Fallon, John Leslie; Kollar, Ernest Paul; and Mares, Fred Ralph, to International Business Machines Corporation. Combing wheel feed nip with second sheet restraint. 4,113,245, Cl. 271-10.000.

Collignon, Herbert E.: *See—*
Godwin, Robert H.; and Collignon, Herbert E., 4,113,220, Cl. 248-400.000.

Collin, Alvaro L.; and Patel, Gordhan M., to Kaiser Steel Corporation. Mine roof support plate. 4,112,693, Cl. 405-132.000.

Collin, Herbert S. Container for cut flowers. 4,113,094, Cl. 206-423.000.

Collins, David John: *See—*
Shephard, Margaret Claire; Sugavanam, Balsubramanyan; Worthington, Paul Anthony; Collins, David John; and Griffin, David, 4,113,465, Cl. 71-92.000.

Collins, Donald L.; and Downing, Harold A., to Collins Industries, Inc. Pin release device for a wheelchair lift. 4,113,121, Cl. 214-75.00R.

Collins Industries, Inc.: *See—*
Collins, Donald L.; and Downing, Harold A., 4,113,121, Cl. 214-75.00R.

Collins, John D.; and Jones, Trevor E., to Albright & Wilson Ltd. Process for preparing organotin halides. 4,113,758, Cl. 260-429.700.

Collins, Joseph C.: *See—*
Surrey, Alexander R.; and Collins, Joseph C., 4,113,774, Cl. 260-558.00D.

Collins, Michael H., to Shell Internationale Research Maatschappij, B.V. Method of applying a layer of polyurethane foam onto a cut or ground surface of polyurethane foam. 4,113,901, Cl. 427-236.000.

Collins, Walter; and Blankumsee, Howard. Composite railroad cross tie with rail support blocks. 4,113,177, Cl. 238-72.000.

Combette, Marc; and Ollivier, Jean. Loading device for a power actuated tool. 4,112,685, Cl. 60-634.000.

Combette, Marc; Dorgnon, Roger; Luthringer, Jean; and Ollivier, Jean. Fastening tool using caseless munition. 4,113,163, Cl. 227-10.000.

Commissariat a l'Energie Atomique: *See—*
Melnick, Igor, 4,113,978, Cl. 13-22.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Wild, John Paul, 4,114,162, Cl. 343-754.000.

Communications Satellite, Corporation: *See—*
Horns, Otakar Anthony, 4,113,997, Cl. 179-170.200.

Con-Spec Devices Inc.: *See—*
Walski, Stanley, 4,113,226, Cl. 249-216.000.

Condon, Michael Edward: *See—*
Ondetti, Miguel Angel; and Condon, Michael Edward, 4,113,715, Cl. 260-112.50R.

Conger, William H.; and Gehringer, Ronald F., to Nordica International, Inc., a part interest. Tamper-proof axial tumbler type lock. 4,112,820, Cl. 70-363.000.

Conrad, Jens; and Bruns, Klaus, to Henkel Kommanditgesellschaft auf Aktien. 2,4-Dioxa-spiro(5,5)undec-8-ene perfume compositions. 4,113,664, Cl. 252-522.000.

Construction Specialties, Inc.: *See—*
Reifsnyder, Howard B., 4,112,640, Cl. 52-177.000.

Contraves AG: *See—*
Brandestini, Marco, 4,112,740, Cl. 73-53.000.

Conway, Terry T.: *See—*
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., 4,113,946, Cl. 544-105.000.

Cook, Edward H., Jr.: *See—*
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., 4,113,922, Cl. 429-33.000.

Cook, Glenn; and Larson, Paul, to Kennecott Copper Corporation. Method and apparatus for the electrolytic recovery of metal employing electrolyte convection. 4,113,586, Cl. 204-105.00R.

Cook, John Gerald; and Shaw, Julian David, to Solartron Electronic Group Ltd., The. Long scale display. 4,114,094, Cl. 324-115.000.

Cook, Robert E., to A. O. Smith Corporation. Flue pipe anode ring for water heater. 4,113,600, Cl. 204-197.000.

Cook, William, Jr.: *See—*
Chang, Nuke Ming; Remkes, Elmer R.; and Cook, William, Jr., 4,112,695, Cl. 405-163.000.

Cooke, Charles M.: *See—*
Mazdiyasni, Khodabakhsh S.; and Cooke, Charles M., 4,113,830, Cl. 264-101.000.

Coons, Robert R.; Hennessey, Richard G.; and Woffenden, John, to International Harvester Company. Cooling fluid circulation in an annular disc brake. 4,113,067, Cl. 188-71.600.

Corfield, John Courtney, to Unimax Switch Limited. Electrical switch having interlock between door and switch. 4,114,001, Cl. 200-50.00A.

Coriden, Paul. Collapsible electronic calculator stand. 4,113,212, Cl. 248-13.000.

Corning Glass Works: *See—*
Sullivan, Kevin J., 4,112,925, Cl. 128-2.00F.

Corse, Kenneth J. Open end baking pan. 4,113,225, Cl. 249-169.000.

Cosack, Claus: *See—*
Hein, Wolfgang; Grundmann, Peter; and Cosack, Claus, 4,113,144, Cl. 222-396.000.

Cosh, Harry Jose. Apparatus for producing motion of a workpiece. 4,112,784, Cl. 74-501.50R.

Costales, Manuel; and Hakki, Moustafa I. Compensating drive for revolving rings. 4,112,666, Cl. 57-105.000.

Cotten, Roger C.; Young, David W.; and Kandanian, Aram Y., to Southern Chemical Company. Compositions comprising polybutene EPDM and polyolefin. 4,113,804, Cl. 260-897.00A.

Coulon, Wladimir A.: *See—*
Estevenel, Yvette Fr. M. J.; Thely, Maurice H.; and Coulon, Wladimir A., 4,113,816, Cl. 264-113.000.

Coutant, Ralph W., to Litton Systems, Inc. Keeper for idler rolls. 4,112,571, Cl. 29-243.500.

Coval, Arthur B.: *See—*
Lee, Arthur L.; and Coval, Arthur B., 4,113,076, Cl. 192-4.00A.

Covington, Wayne L.; and Green, Glen R., to Ore-Ida Foods, Inc. Method and apparatus for forming torn, random size pieces of sausage meat. 4,112,545, Cl. 17-45.000.

Covini, Romano: *See—*
Padovan, Mario; De Alberti, Giordano; Battiston, Giancarlo; and Covini, Romano, 4,113,769, Cl. 562-534.000.

Cowley, Brian Richard: *See—*
Laundon, Brian; Cowley, Brian Richard; and Humber, David Cedric, 4,113,591, Cl. 204-158.0HA.

Cox, Donald E., to Coxwells, Incorporated. Swivel coupling. 4,113,288, Cl. 285-174.000.

Coxwells, Incorporated: *See—*
Cox, Donald E., 4,113,288, Cl. 285-174.000.

CPC International Inc.: *See—*
Leach, Harry Woods; Hebeda, Ronald Emil; and Holik, Dennis John, 4,113,509, Cl. 127-29.000.

Craft, Jacob A.; and Hauser, Hans. Small transmission with brake. 4,113,069, Cl. 188-72.700.

Cragoe, Edward J., Jr.: *See—*
Smith, Robert L.; Stokker, Gerald E.; and Cragoe, Edward J., Jr., 4,113,877, Cl. 424-303.000.

Craig, Robert Simpson, to Acme Resin Corporation. Shell sand with improved thermal shock resistance. 4,113,916, Cl. 428-404.000.

Cramer Industries, Inc.: *See—*
Wehner, Norvin J., deceased, 4,113,221, Cl. 248-408.000.

Creager, John E.: *See—*
Sutton, Stephen J.; Holen, J. Robert; and Creager, John E., 4,114,130, Cl. 338-33.000.

Crosby, Thomas C.: *See—*
Robinson, John William; Crosby, Thomas C.; and Howell, Stephen Louis, 4,112,802, Cl. 84-1.010.

Cross, Raymond Peter, to Pilkington Brothers Limited. Thermal treatment of glass in a fluidized bed. 4,113,458, Cl. 65-114.000.

Csanady, Michael, Jr., to Westinghouse Electric Corp. Valving apparatus. 4,112,975, Cl. 137-625.290.

Csanady, Michael, Jr., to Westinghouse Electric Corp. Dual strainer gate arrangement for turbine oil systems. 4,113,622, Cl. 210-167.000.

Culbertson, Harry M., to Monsanto Company. Process for preparing high ortho novolac resins. 4,113,700, Cl. 528-138.000.

Curfman, Brainerd, Harris, Bell, Weigans and Depew: *See—*
Sanford, Dale J., 4,112,578, Cl. 29-700.000.

Curtice, Walter Richard, to RCA Corporation. Triggered burst generator. 4,114,051, Cl. 307-260.000.

Curtis, Little P.: *See—*
Albaric, Jacques E.; Curtis, Little P.; and Dailey, George F., 4,114,059, Cl. 310-54.000.

Curtis, William M.; and Hermanson, Dean E., to Youngstown Sheet and Tube Company. Pipe coupler for various size flanges. 4,113,283, Cl. 285-12.000.

Custom Plastics, Inc.: *See—*
Tisbo, Cosmo N.; and Tisbo, Thomas A., 4,112,853, Cl. 108-111.000.

Cutler, Ivan B.: *See—*
Virkar, Anil V.; Miller, Mark L.; Cutler, Ivan B.; and Gordon, Ronald S., 4,113,928, Cl. 429-193.000.

Cvacho, Daniel S., to Belgium Tool & Die Co. Coating filter, separator and collector system. 4,113,454, Cl. 55-319.000.

Cycle-Kamp Inc.: *See—*
Olmstead, William Dean, 4,113,301, Cl. 296-23.00H.

Cyphelly, Ivan Jaroslav. Valve arrangement for limiting torque of a hydraulic motor of a centrifuge. 4,113,171, Cl. 233-7.000.

Czerwon, Dieter: *See—*
Schippers, Heinz; Hensen, Friedhelm; Koslowski, Gerhard; and Czerwon, Dieter, 4,113,935, Cl. 526-351.000.

D. G. Beyer, Inc.: *See—*
Derrwaldt, Philip A., 4,113,237, Cl. 254-175.700.

Dadurian, Aram; and Rehder, Gunther. Knee-joint prosthesis. 4,112,522, Cl. 3-1.910.

Daenen, Bernardus, to Van der Molen Machinefabriek B.V. Cutting apparatus. 4,112,799, Cl. 83-409.000.

D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corp.; and RAI Research Corporation. Trifluorostyrene sulfonic acid membranes. 4,113,922, Cl. 429-33.000.

Dahmen, Kurt: *See—*
Hubner, Wolfgang; Barthell, Eduard; and Dahmen, Kurt, 4,113,685, Cl. 260-29.4UA.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Mori, Shigeo; and Fujita, Takeshi, 4,113,667, Cl. 521-163.000.

Dai Nippon Toryo Co., Ltd.: *See—*
Tugukuni, Hideyoshi; and Kano, Masafumi, 4,113,917, Cl. 428-407.000.

Daido Tokushuko Kabushiki Kaisha: *See—*
Watanabe, Kazuo; Endo, Toshio; and Kojima, Katsuhiro, 4,112,626, Cl. 51-35.000.

Daihatsu Diesel Manufacturing Co., Ltd.: *See—*
Kagiyama, Yasuo; and Miyazaki, Nobumasa, 4,113,174, Cl. 236-12.00A.

Dailey, George F.: *See—*
Albaric, Jacques E.; Curtis, Little P.; and Dailey, George F., 4,114,059, Cl. 310-54.000.

Daimler-Benz Aktiengesellschaft: *See—*
Hufendiek, Ernst-Wilhelm, 4,112,897, Cl. 123-139.0ST.
Kohler, Werner; Drucker, Gerhard; Kiess, Ulrich; and Stotz, Manfred, 4,113,925, Cl. 429-78.000.

Dairy Systems, Inc.: *See—*
Heidecker, Robert F., 4,112,758, Cl. 73-218.000.

D'Albora, John M., to United States of America, Navy. Determination of variations of wave characteristics. 4,114,136, Cl. 340-3.00R.

Dale, Glenn H., to Phillips Petroleum Company. Separation of acetone from n-butane by distillation. 4,113,575, Cl. 203-62.000.

Dale, John R.: *See—*
Mason, Russell I.; and Dale, John R., 4,114,137, Cl. 340-85.000.

Dalziel, David G. Airborne rescue device. 4,113,207, Cl. 244-137.00P.

D'Amato, Ralph James, to RCA Corporation. Process of fabricating a cathode ray tube. 4,112,562, Cl. 29-25.140.

Dany, Franz-Josef: *See—*
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; Auel, Theodor; and Kloss, Werner, 4,113,841, Cl. 423-265.000.

D'Aragon, Paul. Insulating installation for a window frame. 4,112,642, Cl. 52-202.000.

Darby, Ronald L. Rebounding ball game. 4,113,252, Cl. 273-95.00R.

Dare Pafco, Inc.: *See—*
Thurman, Paul G., 4,113,329, Cl. 312-111.000.

d'Arras, Philippe, to Societe Coupax. Tenderizer for butcher's meat. 4,112,544, Cl. 17-25.000.

Das, Suryya K.: *See—*
Jozwiak, Edward L., Jr.; and Das, Suryya K., 4,113,598, Cl. 204-181.00R.

Dasy Inter S.A.: *See—*
Brosow, Jorgen; and Furugard, Erik, 4,114,032, Cl. 235-493.000.

Datrix Corporation: *See—*
Travis, Brian A., 4,114,141, Cl. 340-151.000.

David, Gerard Andre: *See—*
Salles, Yvon; Leger, Pierre; and David, Gerard Andre, 4,113,543, Cl. 156-345.000.

Davies, David Evan Naunton: *See—*
Denne, Phillip Raymond Michael; Davies, David Evan Naunton; and McEwen, Colin Dougal, 4,114,151, Cl. 343-6.8LC.

Davis, Edward B. Motorized inverting exerciser with body guard permitting selection of desired stress. 4,113,250, Cl. 272-93.000.

Davis, Edwin J. Window solar heating unit. 4,112,919, Cl. 126-270.000.

Davis, Gerald L.; and Scott, Timothy C., to Sundstrand Corporation. Reversing valve. 4,112,974, Cl. 137-625.290.

Davis, Harry Robert: *See—*
Stuart, Linden, Jr.; and Davis, Harry Robert, 4,113,545, Cl. 156-392.000.

Davis, Pauls: *See—*
Helfert, Herbert; Davis, Pauls; and Langdon, William Keith, 4,113,785, Cl. 260-615.00B.

Davis, Robert H., to United States of America, Navy. Digital signal synthesis system. 4,114,189, Cl. 364-718.000.

Davoli, Velmore: *See—*
Mayr, Adolfo; Davoli, Velmore; Leccese, Antonio; and Susa, Ermanno, 4,113,654, Cl. 252-429.00C.

Day, Frederick L. Travel insert chair and method of transporting the physically handicapped. 4,113,307, Cl. 297-232.000.

Day, Paul B., to Gai-Tronics Corporation. Mine dial and page phone system. 4,113,985, Cl. 179-2.00R.

Dayet, Jacques; Martin, Joseph; and Nicola, Charles, to Delle-Alsthom S.A. Gas-blast electric cut-out device. 4,114,004, Cl. 200-148.00A.

De Dietrich (USA), Inc.: *See—*
Schlosberg, Seymour; and Lerman, Michael J., 4,112,572, Cl. 29-401.00R.

De Alberti, Giordano: *See—*
Padovan, Mario; De Alberti, Giordano; Battiston, Giancarlo; and Covini, Romano, 4,113,769, Cl. 562-534.000.

Debat, Jacques, to Institut de Recherches Chimiques et Biologiques Appliquees. Compositions for the treatment of disorders of the prostate gland. 4,113,875, Cl. 424-278.000.

DeBoer, Clarence; Dolak, Lester A.; and Peterson, Durey H., to Upjohn Company, The. Composition of matter and process. 4,113,855, Cl. 424-117.000.

deBrebisson, Michel, to U.S. Philips Corporation. Method of manufacturing a semiconductor device by non-selectively implanting a zone of pre-determined low resistivity. 4,113,513, Cl. 148-1.500.

De Castro Basto, Arthur Jose. Apparatus for teaching or practising bridge. 4,112,592, Cl. 35-8.00B.

Decca Limited: *See—*
Ilieve, Peter John, 4,114,179, Cl. 358-34.000.

Deck, Howard C.: *See—*
Feltz, Albert J.; and Deck, Howard C., 4,113,368, Cl. 352-159.000.

Decker, Lloyd Burr, to Harter Corporation. Snub assembly for securing covering material to a wall panel module. 4,112,643, Cl. 52-222.000.

Deckers, Albert T.: *See—*
Extra, Piet M. J.; Smeets, Lambertus R. J. M.; Van Bavel, Adrianus W. M.; Van Lieshout, Jacobus J.; and Deckers, Albert T., 4,112,870, Cl. 118-657.000.

de Cointet de Fillain, Paul: *See—*
Pigerol, Charles; de Cointet de Fillain, Paul; and Nanthavong, Souli, 4,113,736, Cl. 260-326.160.

DeCorso, Serafino M., to Westinghouse Electric Corp. Hybrid combustor with staged injection of pre-mixed fuel. 4,112,676, Cl. 60-39.710.

DeCorso, Serafino M.: *See—*
Pillsbury, Paul W.; and DeCorso, Serafino M., 4,112,675, Cl. 60-39.060.

Deffner, John F.: *See—*
Bunting, Pamela M.; and Deffner, John F., 4,113,444, Cl. 44-72.000.

Degremont: *See—*
Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, 4,113,596, Cl. 204-180.00R.

Deguchi, Hidetaka; Kikuchi, Shoji; Wada, Hajime; Satoh, Shui; and Endo, Takaya, to Konishiroku Photo Industry Co., Ltd. Color photographic developing composition. 4,113,491, Cl. 96-66.00R.

DeHart, John R.; Nelson, Larry L.; and Krehl, William H., to Docutronix, Inc. Device for checking envelopes for enclosed documents. 4,113,105, Cl. 209-549.000.

Dehnert, Johannes; and Dunkelmann, Guenter, to BASF Aktiengesellschaft. Disperse azo dye with diaminopyrimidine coupling component. 4,113,720, Cl. 260-154.000.

Deiner, Hans; Mosch, Franz; and Bernheim, Willy, to Ciba-Geigy Corporation. Addition products of an N-allylamino-s-triazine and an organopolysiloxane. 4,113,947, Cl. 544-196.000.

de Kanter, Hendrik, to DKA, Inc. Glass cylinder subdividing apparatus and method. 4,112,627, Cl. 51-79.000.

Deknatel, Inc.: *See—*
Kurtz, Leonard D.; and Bidwell, Robert E., 4,112,948, Cl. 128-276.000.

Delalande S. A.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., 4,113,951, Cl. 544-360.000.

Deli, Jack M., to International Harvester Company. Torsielastic thrust bushing for track chains. 4,112,574, Cl. 29-527.100.

Delle-Alsthom S.A.: *See—*
Dayet, Jacques; Martin, Joseph; and Nicola, Charles, 4,114,004, Cl. 200-148.00A.

Del Monte, Louis A., to Honeywell Inc. Microcircuit device metallization. 4,113,578, Cl. 204-15.000.

DeLorenzo, Mario M. Foldable saw horse. 4,113,056, Cl. 182-153.000.

Demag, A.G.: *See—*
Gudenau, H. W.; Konig, Horst; Rath, Gero; and Roth, Haye, 4,113,468, Cl. 75-12.000.

Demers, Robert Augustus, to Bell Telephone Laboratories, Incorporated. Selective calling circuit. 4,114,138, Cl. 340-147.00R.

Denk, Joseph P.: *See—*
Ganske, Kingston; Hibbard, Earl R.; Falk, Mervin L.; and Denk, Joseph P., 4,114,183, Cl. 360-99.000.

Denne, Phillip Raymond Michael; Davies, David Evan Naunton; and McEwen, Colin Dougal, to Alfa-Laval Company Limited. Passive transponder apparatus for use in an interrogator-responder system. 4,114,151, Cl. 343-6.8LC.

Denzene, Quentin S., to E. F. Johnson Company. Radio channel skip system. 4,114,102, Cl. 325-470.000.

Denzene, Quentin S., to E. F. Johnson Company. Channel skip memory system for radio receiver. 4,114,104, Cl. 325-470.000.

Denzer, Max; and Smith, Joseph A., to Sandoz, Inc. Process for the preparation of substituted isoxazolo[4,5-c]pyridin-4-(5H)-ones. 4,113,727, Cl. 544-362.000.

de Putter, Warner Jan, to Wavin B.V. Process for perforating plastics tubes. 4,112,795, Cl. 83-15.000.

Derdzinski, Terrence Edmund; and Karlin, James Hilliard, to Motorola, Inc. Modular console enclosure with writing surface. 4,113,331, Cl. 312-198.000.

DeRouen, Joseph Rodolph; and Kucharski, Lawrence, Jr., to Bourns, Inc. Worm gear potentiometer ratchet system. 4,114,132, Cl. 338-174.000.

Derrwaldt, Philip A., to D. G. Beyer, Inc. Cable tension control. 4,113,237, Cl. 254-175.700.

Deruelle, Jean, to Stein Industrie. Combustion of hot gases of low calorific power. 4,113,417, Cl. 431-5.000.

Desai, Ardeshir R.: *See*—
Lammert, Wayne F.; Simpson, Dayton M.; and Desai, Ardeshir R., 4,112,698, Cl. 405-167.000.

Deshpande, Narayan V., to Xerox Corporation. Resilient lithographic masters for direct printing. 4,112,841, Cl. 101-141.000.

Desiderio, Angelo C., to Oak Industries, Incorporated. Low level relay contact blades. 4,114,007, Cl. 200-246.000.

DeSimone, Robert Santora, to Polak's Frutal Works, Inc. Bleach compositions containing perfume oils. 4,113,645, Cl. 252-187.00H.

DeSoto, Inc.: *See*—
Rabi, Rafat T.; Murphy, Edward J.; and Basoms, John A., 4,113,597, Cl. 204-181.00C.
Sekmakas, Kazys, 4,113,793, Cl. 260-850.000.

de Sousa, Bernardo: *See*—
Siegrist, Adolf Emil; and de Sousa, Bernardo, 4,113,938, Cl. 542-464.000.

DeStephanis, Ralph, to RCA Corporation. Record support and alignment apparatus for a video disc player. 4,113,262, Cl. 274-9.00B.

Detcher, Theodore E., to Black Clawson Company, The. Dewatering screen. 4,113,626, Cl. 210-409.000.

Deutsch, Ralph, to Deutsch Research Laboratories, Ltd. Ensemble and anharmonic generation in a polyphonic tone synthesizer. 4,112,803, Cl. 84-1.240.

Deutsch Research Laboratories, Ltd.: *See*—
Deutsch, Ralph, 4,112,803, Cl. 84-1.240.

Deutsche Babcock Aktiengesellschaft: *See*—
Noack, Rolf; Schuster, Joachim; and Lohse, Udo, 4,112,728, Cl. 72-154.000.

Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See*—
Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, 4,113,773, Cl. 260-545.00R.
Prescher, Gunter: Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,113,747, Cl. 260-348.250.

Deutsche Texaco Aktiengesellschaft: *See*—
Strehlke, Gunter; and Osterburg, Gunther, 4,113,780, Cl. 260-593.00P.

De Vito, Vincent P.: *See*—
Moen, George E.; and De Vito, Vincent P., 4,114,012, Cl. 219-10.55R.

DeWitt, James S.: *See*—
DeWitt, Stuart; and DeWitt, James S., 4,112,550, Cl. 24-73.0BP.

DeWitt, Stuart; and DeWitt, James S. Suspended ceiling hook. 4,112,550, Cl. 24-73.0BP.

Dey, Ervin J., to SPS Technologies, Inc. Grommet assembly. 4,112,993, Cl. 151-41.740.

Diagnostic Isotopes Incorporated: *See*—
Finn, James J., 4,113,097, Cl. 206-528.000.

Diamalt Aktiengesellschaft: *See*—
Rambacher, Paul; and Make, Siegfried, 4,113,950, Cl. 544-314.000.

Dickert, Yancey J.: *See*—
Miller, Stephen L.; and Dickert, Yancey J., 4,113,674, Cl. 260-9.000.

Dickey-john Corporation: *See*—
Knepler, John T., 4,112,777, Cl. 73-728.000.

Diebold Incorporated: *See*—
Graef, Harry T.; Richardson, Jack M.; and Wolfarth, Robert P., 4,113,140, Cl. 221-6.000.

Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., to Armstrong Cork Company. Curable aryloxyphosphazene polymers. 4,113,670, Cl. 521-95.000.

Diehl, Harry Weldon. Method of treating rheumatoid arthritis. 4,113,881, Cl. 424-312.000.

Dielectric Laboratories, Inc.: *See*—
Lupfer, David A., 4,114,120, Cl. 333-84.00M.

Diesch, Robert E., to Pako Corporation. Knife assembly for photographic strip cutter. 4,112,801, Cl. 83-586.000.

Dietz, Raymond A. F.; Fundom, Danny L.; Henning, George J.; and McKinney, Lynn B., to Van Dorn Company. Tray-type processed food containers. 4,113,095, Cl. 206-508.000.

Dillinger, Lester L. Apparatus for drilling or reaming. 4,113,405, Cl. 408-226.000.

DiMola, Nunzio: *See*—
Winters, Giorgio; and DiMola, Nunzio, 4,113,731, Cl. 260-288.0CF.

Dipsol Chemical Company, Ltd.: *See*—
Oshima, Kathuhide; Takasaki, Haruyuki; and Takahashi, Akio, 4,113,583, Cl. 204-55.00Y.

Director-General Agency of Industrial Science and Technology: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, 4,113,441, Cl. 422-197.000.

Dirksing, Robert S.; and Todd, Estel R., to Procter & Gamble Company, The. Fluid injector. 4,114,195, Cl. 366-167.000.

Discojet Corporation: *See*—
Moller, Paul S., 4,113,051, Cl. 181-231.000.

Distillers Company (Carbon Dioxide) Ltd., The: *See*—
Wheldon, Alfred G.; and Harris, Ernest D., 4,112,736, Cl. 73-23.000.

Distler, Harry; Schlecht, Helmut; and Hartert, Erwin, to BASF Aktiengesellschaft. Manufacture of N-substituted glycinonitriles. 4,113,764, Cl. 260-465.50A.

Dittmer, William H.: *See*—
Wycoff, Keith H.; and Dittmer, William H., 4,114,142, Cl. 340-164.00R.

Dixon, William Paul. Power source for subsea oil wells. 4,112,687, Cl. 60-641.000.

DKA, Inc.: *See*—
de Kanter, Hendrik, 4,112,627, Cl. 51-79.000.

Dobson Park Industries Limited: *See*—
Jeffrey, Ian Campbell, 4,113,123, Cl. 214-141.000.
Phillips, Reginald Andrew; Hamilton, Terence; and Thompson, Arthur David, 4,113,316, Cl. 299-31.000.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Pries, Erich, 4,113,570, Cl. 202-139.000.

Dr. Carl Hahn G.m.b.H.: *See*—
Friese, Axel; and Simon, Stefan, 4,113,083, Cl. 198-480.000.

Documation Incorporated: *See*—
Bushman, Willard T.; and Snyder, Robert C., 4,114,031, Cl. 235-474.000.

Docutronix, Inc.: *See*—
DeHart, John R.; Nelson, Larry L.; and Krehl, William H., 4,113,105, Cl. 209-549.000.

Doerman, Eryk Stefan: *See*—
Preston, Edward George; and Doerman, Eryk Stefan, 4,112,954, Cl. 131-21.00R.

Doggett, Neil: *See*—
Lappage, James; Doggett, Neil; and Yates, Stephen William, 4,112,662, Cl. 57-34.0AT.

Doi, Kaname, to Sumitomo Electric Industries, Ltd. Load-responsive pressure proportioning reducing valve assembly for vehicle hydraulic brake system. 4,113,318, Cl. 303-24.00F.

Dolak, Lester A.: *See*—
DeBoer, Clarence; Dolak, Lester A.; and Peterson, Durey H., 4,113,855, Cl. 424-117.000.

Dolenko, Allan J.: *See*—
Clarke, Michael R.; and Dolenko, Allan J., 4,113,675, Cl. 260-17.500.

Dolidze, Vladimir Romanovich: *See*—
Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Sobolev, Valerian Mikhailovich; Rutman, Grigory Iosifovich; Logutov, Igor Jurievich; and Dolidze, Vladimir Romanovich, 4,113,976, Cl. 568-789.000.

Dominguez, Richard Lee. Lighting fixture. 4,114,186, Cl. 362-35.000.

Donaldson Company, Inc.: *See*—
Wagner, Wayne M.; and Campbell, John A., 4,113,289, Cl. 285-322.000.

Dondi, Gilberto; and Zanotti, Arnaldo, to Bayer Italia Societa per Azioni. Fruit juice-sugar granules. 4,113,865, Cl. 424-230.000.

Donn Products, Inc.: *See*—
Mieyal, David F., 4,113,219, Cl. 248-354.00R.

Donnelli, Joseph W.; and Barnes, Richard D., to Southern Imperial, Inc. Merchandising system for use with perforated panels or the like. 4,113,109, Cl. 211-49.00R.

Donner-Hanna Coke Corporation: *See*—
Mahar, Kevin D., 4,113,569, Cl. 201-39.000.

Donner, Joseph E., to Unitek Corporation. Feedback-controlled radiant furnace for firing ceramic material and the like. 4,114,024, Cl. 219-489.000.

Dooley, Richard A. Apparatus for producing cams. 4,112,819, Cl. 90-13.900.

Dore, James E., to Swiss Aluminium Ltd. Apparatus for the filtration of molten metal in a crucible type furnace. 4,113,241, Cl. 266-227.000.

Dorgnon, Roger: *See*—
Combette, Marc; Dorgnon, Roger; Luthringer, Jean; and Ollivier, Jean, 4,113,163, Cl. 227-10.000.

Dorogochinsky, Akivy Zinovievich: *See*—
Mirsky, Yakov Volfovich; Dorogochinsky, Akivy Zinovievich; Meged, Nelli Fillipovna; and Kosolapova, Antonina Pavlovna, 4,113,843, Cl. 423-329.000.

Dorsey, Geoffrey A., Jr., to Kaiser Aluminum & Chemical Corporation. Method of forming an aluminum oxide coating. 4,113,520, Cl. 148-6.270.

Doss, Richard C., to Phillips Petroleum Company. Process for applying sealant composition. 4,113,914, Cl. 428-355.000.

Doss, Richard C.: *See*—
Louthan, Rector P.; and Doss, Richard C., 4,113,707, Cl. 528-279.000.

Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., to Hercules Incorporated. Copolymers of alpha-methylstyrene and styrene and uses thereof. 4,113,801, Cl. 260-876.00B.

Douglas, Waymon Joe; and Douglas, Wilburn Cleatus. Article handling apparatus. 4,113,117, Cl. 214-8.50C.

Douglas, Wilburn Cleatus: *See—*
Douglas, Waymon Joe; and Douglas, Wilburn Cleatus, 4,113,117, Cl. 214-8.50C.

Dovzhko, Fedor Evdokimovich: *See—*
Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich, 4,112,702, Cl. 62-123.000.

Dow Chemical Company, The: *See—*
Johnson, David R., 4,113,584, Cl. 204-64.00R.
Langhorst, Martin A.; Sinke, Gerard C.; and Mossner, Elmer H., 4,113,471, Cl. 75-101.00R.
Miller, Stephen L.; and Dickert, Yancey J., 4,113,674, Cl. 260-9.000.
Pickelman, Dale M., Sr.; and Wessling, Ritchie A., 4,113,710, Cl. 526-30.000.
Strojny, Edwin J.; Friedli, Hans R.; and Wing, Milton S., 4,113,745, Cl. 260-346.750.
Thompson, James L., 4,113,631, Cl. 252-8.55C.
Trucks, Roger O.; and Steiner, Edwin C., 4,113,739, Cl. 260-338.000.

Dowa Co., Ltd.: *See—*
Miyahara, Kingo, 4,113,421, Cl. 431-122.000.

Dowa Mining Co., Ltd.: *See—*
Obinata, Shiro; Hashimoto, Shigeru; and Sahara, Takeshi, 4,113,106, Cl. 209-167.000.

Downing, Harold A.: *See—*
Collins, Donald L.; and Downing, Harold A., 4,113,121, Cl. 214-75.00R.

Downing, James H., Jr. All-electric A.C. tractor. 4,113,045, Cl. 180-65.00C.

Doyle, Terrence W.: *See—*
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., 4,113,946, Cl. 544-105.000.

Dragerwerk Aktiengesellschaft: *See—*
Jeretin, Stojan, 4,112,938, Cl. 128-142.00R.

Dravo Corporation: *See—*
Pietrusza, Arthur Jacob; and Kent, Harry James, 4,113,413, Cl. 435-222.000.

Dreibelbis, Logan L., to Advanced Drainage Systems, Inc. Tube slotter. 4,112,810, Cl. 83-490.000.

Driscoll, John J.; and Wareham, Richard R., to Polaroid Corporation. Self-developing camera and viewer. 4,114,166, Cl. 354-76.000.

Driscoll, Michael J.; and Bowman, Frank L., to Massachusetts Institute of Technology. Core catcher for nuclear reactor core meltdown containment. 4,113,560, Cl. 176-38.000.

Drossbach, Hubert, to Agro-Erip, Incorporated. Drain pipe method. 4,113,818, Cl. 264-154.000.

Drucker, Gerhard: *See—*
Kohler, Werner; Drucker, Gerhard; Kiess, Ulrich; and Stotz, Manfred, 4,113,925, Cl. 429-78.000.

Dubois, Leo Francis. Trash can transporter. 4,113,214, Cl. 248-146.000.

DuBosque, Clayton, Jr.; Rudd, Wallace C.; and Allen, Richard J., to Thermatool Corp. Method of manufacturing heat exchange panels. 4,112,566, Cl. 29-157.30C.

Ducellier et Cie: *See—*
Habert, Roger, 4,112,895, Cl. 123-117.00R.

Ducellier et Co.: *See—*
Chateau, Louis Jean, 4,112,887, Cl. 123-117.00D.

Duff, Ian David; Kennedy, John Hamilton; and Bunce, Roger Abraham, to Secretary of State for Social Services, The. Liquid storage device. 4,113,437, Cl. 422-63.000.

Dufour, Raymond J.: *See—*
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 4,113,004, Cl. 165-3.000.

Duncan, Herbert Alan, to Motorola, Inc. Noise blanker circuit. 4,114,105, Cl. 325-480.000.

Dunkelmann, Guenter: *See—*
Dehnert, Johannes; and Dunkelmann, Guenter, 4,113,720, Cl. 260-154.000.

Dunlop Limited: *See—*
Mills, Anthony Mark; and Buck, David Lyndon, 4,112,994, Cl. 152-354.00R.

Dunn, Paul E.: *See—*
Slater, Charles E.; Dunn, Paul E.; and Mustain, Lewis B., 4,114,027, Cl. 235-419.000.

Du Pont de Nemours, E. I., and Company: *See—*
Alegranti, Constance Wright, 4,113,628, Cl. 210-500.00M.
Harmuth, Charles Moore, 4,113,681, Cl. 260-28.50D.
Portnoy, Robert Charles, 4,113,724, Cl. 544-408.000.
Resnick, Paul Raphael; and Grot, Walther Gustav, 4,113,585, Cl. 204-98.000.

Durbin, John Alan, to Xerox Corporation. Optical system for alternatively projecting adjacent images of adjacent objects or double images of a single object. 4,113,370, Cl. 353-122.000.

Dussich, Manlio V. Sunglass method and apparatus. 4,113,364, Cl. 351-49.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Herbst, Thomas, 4,112,637, Cl. 52-155.000.

Dynamit Nobel Aktiengesellschaft: *See—*
aus der Funten, Helmut; and Vogt, Wilhelm, 4,113,741, Cl. 260-343.30R.

Blumenfeld, Georg; and Vollkommer, Norbert, 4,113,703, Cl. 528-299.000.
Haage, Karl; and Scharff, Dieter, 4,113,907, Cl. 428-111.000.
Helfgen, Werner; Lindner, Gerhard; Lingens, Paul; and Kaufmann, Helmut, 4,113,811, Cl. 264-3.00R.
Kreuzburg, Gerhard; Lenz, Arnold; and Rogler, Walter, 4,113,761, Cl. 260-448.80A.
Psencik, Erich, 4,113,702, Cl. 528-75.000.

Dynapol: *See—*
Bellanca, Nicolo; and Furia, Thomas Edward, 4,113,505, Cl. 106-137.000.

Dzyan, Valentin Ivanovich: *See—*
Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich, 4,112,702, Cl. 62-123.000.

E. F. Johnson Company: *See—*
Denzene, Quentin S., 4,114,102, Cl. 325-470.000.
Denzene, Quentin S., 4,114,104, Cl. 325-470.000.

E M I Limited: *See—*
Lee, Cyril Arthur, 4,114,029, Cl. 235-449.000.

E. R. Squibb & Sons, Inc.: *See—*
Hauck, Frederic Peter; and Cimarusti, Christopher Michael, 4,113,726, Cl. 544-380.000.
Ondetti, Miguel Angel; and Condon, Michael Edward, 4,113,715, Cl. 260-112.50R.
Treuner, Uwe D.; and Breuer, Hermann, 4,113,943, Cl. 544-26.000.
Varma, Ravi K.; and Cimarusti, Christopher M., 4,113,722, Cl. 260-239.55R.

Eastman Kodak Company: *See—*
Lelental, Mark; and Light, William Andrew, 4,113,484, Cl. 96-1.00R.
Sandhu, Mohammad Akram; and Tingler, Kenneth Lloyd, 4,113,493, Cl. 96-67.000.

Ebeling, Martti Olavi Aladar; and Lunden, Risto Waldemar, to Kontekla Oy. Rain water roof outlet or similar for a building. 4,112,691, Cl. 405-119.000.

Ebihara, Masatomi; Inoue, Masahide; and Hidaka, Tsuneo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Sintered apatite body. 4,113,500, Cl. 106-39.500.

Ecsery, Zoltan: *See—*
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, 4,113,868, Cl. 424-251.000.

Edamoto, Yoshito. Temporary sealant of a nozzle opening of sliding nozzle. 4,113,501, Cl. 106-56.000.

Eguchi, Tadashi: *See—*
Tanaka, Shinzo; Tsubamoto, Shinichi; Yamashita, Koichi; Eguchi, Tadashi; and Inoue, Kashirou, 4,113,434, Cl. 23-232.00R.

Ehrhart, Leonard M.; Pratte, John R.; and Mazik, Paul E., Jr., to Pullman Incorporated. Adjustable thickness vent door assembly for cargo bodies. 4,112,621, Cl. 49-400.000.

Einerhand, Johan Jozef; Erkens, Leonardus Johannes Hubertus; Laenen, Rene Johannes; and Hoofs, Joseph Wilhelmus Jacobus, to Hercules Incorporated. Iron blue pigment composition and process for its production. 4,113,508, Cl. 106-304.000.

Eisai Co., Ltd.: *See—*
Igarashi, Toshiji; and Nakajima, Yoshikage, 4,113,870, Cl. 424-266.000.

Electric Machinery Mfg. Company: *See—*
Sandor, Leslie W., 4,114,019, Cl. 219-137.00R.

Electric Power Research Institute, Inc.: *See—*
Brobeck, William M., 4,112,785, Cl. 74-572.000.
Holman, Robert R.; and Turkall, Daniel N., 4,113,242, Cl. 277-1.000.
Sisk, Francis J.; and Veyo, Stephen E., 4,112,705, Cl. 62-238.000.

Electro-Sound, Inc.: *See—*
Rehklau, George D., 4,113,196, Cl. 242-56.00R.

Electronics Corporation of America: *See—*
Cade, Phillip J., 4,113,419, Cl. 431-78.000.

Electronics for Medicine, Inc.: *See—*
Feldman, Charles L.; and Hubelbank, Mark, 4,112,930, Cl. 128-2.06R.

Eley, Edgar R., to Westinghouse Electric Corp. Load break bushing. 4,113,339, Cl. 339-111.000.

Ellington, Gordon H.; Mitchell, William O.; and Estapa, Don E., to Oxford Industries, Inc. Method of fabricating shirt cuffs. 4,112,860, Cl. 112-262.000.

Ellis, James Arthur: *See—*
Wright, Glenn Lamont; and Ellis, James Arthur, 4,112,540, Cl. 16-99.000.

Eltra Corporation: *See—*
Hayes, Clyde M., 4,114,061, Cl. 310-241.000.
Lang, Roger J.; and Lang, Gary E., 4,113,335, Cl. 339-29.00R.

Emerson Electric Co.: *See—*
Henderson, David L., 4,113,518, Cl. 148-6.15Z.

EMI Limited: *See—*
Hounsfield, Godfrey Newbold, 4,114,040, Cl. 250-445.00T.
LeMay, Christopher Archibald Gordon, 4,114,042, Cl. 250-445.00T.
Oliver, Colin Charles, 4,114,041, Cl. 250-445.00T.

Emmons, Marvin L. Convertible hat blocking structure. 4,113,154, Cl. 223-24.000.

Empire Metal Products Corp.: *See—*
Stewart, David E., 4,112,622, Cl. 49-421.000.

Emura, Tomoyuki: *See*—
Sekihara, Takeshi; Emura, Tomoyuki; and Murashige, Masayuki, 4,113,932, Cl. 526-74.000.

Enami, Shiroh: *See*—
Mukaemachi, Takuji; Takeshita, Tetsuo; and Enami, Shiroh, 4,113,988, Cl. 179-18.0ES.

Endo, Takaya: *See*—
Deguchi, Hidetaka; Kikuchi, Shoji; Wada, Hajime; Satoh, Shui; and Endo, Takaya, 4,113,491, Cl. 96-66.00R.

Endo, Toshio: *See*—
Watanabe, Kazuo; Endo, Toshio; and Kojima, Katsuhiro, 4,112,626, Cl. 51-35.000.

Enenkel, Hans-Joachim: *See*—
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, 4,113,863, Cl. 424-205.000.

Energy Conversion Devices, Inc.: *See*—
Hallman, Robert W., 4,113,494, Cl. 96-75.000.

Energy Research Inc.: *See*—
Harpman, Webster B., 4,112,889, Cl. 123-25.00B.

Engel, Lawrence J.; and Gardiner, John B., to Exxon Research & Engineering Co. Aminated polymeric additives for fuels and lubricants. 4,113,636, Cl. 252-51.50R.

Engelhardt, Bernard H.; and Mintz, Marcus. Liquid level measuring apparatus. 4,112,761, Cl. 73-312.000.

Engineered Systems, Inc.: *See*—
Kubina, John, 4,114,140, Cl. 340-149.00A.

Englund, Gosta Roland, to Svenska Dataregister Aktiebolag. Driving device for a print head. 4,112,840, Cl. 101-93.150.

Enlow, William Palmer: *See*—
Hechenbleikner, Ingenuin; and Enlow, William Palmer, 4,113,807, Cl. 260-969.000.

Entoleter, Inc.: *See*—
Wattles, Gurdon B.; and Vecsey, Louis R., 4,113,191, Cl. 241-188.00A.

Environmental Devices Corporation: *See*—
Kerfoot, William B.; and Brainard, Edward C., II, 4,112,741, Cl. 73-53.000.

Eppe, Rudolf; Schnall, Gunther; Mullritter, Ludwig; Beck, Johann; and Hartwig, Karl, to Agfa-Gevaert AG. Copying apparatus. 4,113,373, Cl. 355-8.000.

Epstein, James Stephen, to Hewlett-Packard Company. Surveying instrument and method. 4,113,381, Cl. 356-5.000.

Epstein, Max; Marhic, Michel E.; and Schacham, Samuel E., to Northwestern University. Apparatus and method for efficient synthesis of laser light. 4,114,112, Cl. 331-94.50C.

Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich. Process for the production of alumina from the mineral component of solid fuels. 4,113,833, Cl. 423-131.000.

Erickson, John W.: *See*—
Brown, Francis Barton; and Erickson, John W., 4,113,452, Cl. 55-203.000.

Eriksson, Lennart: *See*—
Schibbye, Hjalmar; and Eriksson, Lennart, 4,112,701, Cl. 62-84.000.

Erkens, Leonardus Johannes Hubertus: *See*—
Einerhand, Johan Jozef; Erkens, Leonardus Johannes Hubertus; Laenen, Rene Johannes; and Hoofs, Joseph Wilhelmus Jacobus, 4,113,508, Cl. 106-304.000.

Ernst, Ludwig. Disperser head for seed and fertilizer drill machines. 4,113,148, Cl. 222-139.000.

Ernsthausen, Roger E., to Owens-Illinois, Inc. Multiple gaseous discharge display/memory panel having improved voltage characteristics. 4,114,064, Cl. 313-188.000.

ESB Incorporated: *See*—
Margalit, Nehemiah, 4,113,929, Cl. 429-194.000.

Escher Wyss Limited: *See*—
Miller, Helmut, 4,113,325, Cl. 308-9.000.

ESGE-MARBY GmbH & Co.: *See*—
Niemann, Heinz, 4,113,158, Cl. 224-39.000.

Etablissement Valvin: *See*—
Poinsard, Elisabeth Michele; and Poinsard, Robert Gaston, 4,112,829, Cl. 99-277.000.

Estapa, Don E.: *See*—
Ellington, Gordon H.; Mitchell, William O.; and Estapa, Don E., 4,112,860, Cl. 112-262.000.

Esters, Ernie B. Dynamoelectric machine with inner and outer stators. 4,114,057, Cl. 310-46.000.

Estes, John H.: *See*—
Herbstman, Sheldon; Webb, Allen N.; and Estes, John H., 4,113,657, Cl. 252-442.000.
Rao, Babu Y.; Nolan, John T., Jr.; and Estes, John H., 4,113,789, Cl. 260-683.680.

Estes, Robert T.: *See*—
MacLean, Donald L.; and Estes, Robert T., 4,113,704, Cl. 528-289.000.

Estevenel, Yvette Fr. M. J.; Thely, Maurice H.; and Coulon, Wladimir A., to Choay S.A. Process for the manufacture of layered tablets incorporating controlled-release microcapsules. 4,113,816, Cl. 264-113.000.

Etablissements Carpano & Pons: *See*—
Mazuir, Maurice, 4,114,190, Cl. 364-900.000.

Ethyl Corporation: *See*—
Lawrence, Walter W., Jr.; McKay, Tom W.; and Wiegand, Karl E., 4,113,771, Cl. 562-568.000.

Evans, David H.; and Greenwald, Richard B., to Polaroid Corporation. Conversion of N-tosylsulfoximides to sulfoximines. 4,113,738, Cl. 260-327.00M.

Evans Products Company: *See*—
Johnson, Peter E.; and Rowland, Bob G., 4,113,927, Cl. 429-143.000.

Evans, Robert T.; and Farley, David L., to Halliburton Company. Reclosable circulation valve for use in oil well testing. 4,113,012, Cl. 166-264.000.

Everett/Charles, Inc.: *See*—
Long, Lewis Frank, 4,114,093, Cl. 324-73.0AT.

Exner, Lawrence J.: *See*—
Rosenthal, Isadore; Exner, Lawrence J.; Niksa, Gregory J.; Weiss, Warren I.; and Young, Maurice G., 4,112,714, Cl. 68-206.000.

Extra, Piet M. J.; Smeets, Lambertus R. J. M.; Van Bavel, Adrianus W. M.; Van Lieshout, Jacobus J.; and Deckers, Albert T., to Oce-van der Grinten N.V. Apparatus for developing electrostatic charge images. 4,112,870, Cl. 118-657.000.

Exxon Research & Engineering Co.: *See*—
Engel, Lawrence J.; and Gardiner, John B., 4,113,636, Cl. 252-51.50R.
Gorbaty, Martin L.; Tao, Frank F.; and Maa, Peter S., 4,113,602, Cl. 208-8.000.
Gorbaty, Martin L., 4,113,615, Cl. 210-40.000.
Kantner, Edward, 4,113,924, Cl. 429-50.000.
Lonstrup, Thorkild F.; Brownawell, Darrell W.; Goletz, Edward, Jr.; and Numair, Solomon J., 4,113,639, Cl. 252-51.50A.
Palkes, Mark, 4,112,918, Cl. 126-270.000.
Riley, Kenneth L.; and Pine, Lloyd A., 4,113,656, Cl. 252-439.000.
Watson, Albert T.; and Hull, Robert L., 4,113,806, Cl. 260-897.00A.

Fabriksmontering i Trelleborg AB: *See*—
Anderberg, Nils-Eric, 4,112,958, Cl. 135-5.00A.

Fabrique Nationale Herstal S.A. en abrege FN: *See*—
Bourlet, Maurice V., 4,112,817, Cl. 89-33.00B.

Facchini, Rigo: *See*—
Cole, Lawrence S.; Cole, Ruth J.; and Facchini, Rigo, 4,112,800, Cl. 83-411.00A.

Fahlen, Theodore S.: *See*—
Pressley, Robert J.; and Fahlen, Theodore S., 4,114,114, Cl. 331-94.5PE.

Fairchild Camera and Instrument Corporation: *See*—
Kendall, Larry J., 4,114,149, Cl. 340-347.0AD.

Falk Corporation, The: *See*—
Phinney, John M., 4,113,077, Cl. 192-.098.

Falk, Mervin L.: *See*—
Ganske, Kingston; Hibbard, Earl R.; Falk, Mervin L.; and Denk, Joseph P., 4,114,183, Cl. 360-99.000.

Falk, Richard A. Molten metal dip sampler. 4,112,769, Cl. 73-425.40R.

Fallon, John Leslie: *See*—
Colglazier, Donald Francis; Fallon, John Leslie; Kollar, Ernest Paul; and Mares, Fred Ralph, 4,113,245, Cl. 271-10.000.

Farley, David L.: *See*—
Evans, Robert T.; and Farley, David L., 4,113,012, Cl. 166-264.000.

Farley, James R.: *See*—
Maier, Alfred E.; Armstrong, Donald D.; and Farley, James R., 4,114,005, Cl. 200-153.00G.

Farr, Glyn Phillip Reginald, to Girling Limited. Brake pressure reducing control valve. 4,113,317, Cl. 303-6.00C.

Farr, Glyn Phillip Reginald, to Girling Limited. Dual hydraulic braking system for vehicles. 4,114,145, Cl. 340-626.000.

Fasbender, Heinz: *See*—
Hoppen, Heinz; and Fasbender, Heinz, 4,113,187, Cl. 241-24.000.

Faulkenberry, Wayne J.; and Riviere, Henry W., to General Electric Company. Overdrive protection circuit. 4,114,108, Cl. 330-207.00P.

Featherstone, Harry Edwin; and Sniff, Walter Grant, Jr., to Orrville Products, Inc. Method of joining two sheet metal parts. 4,114,020, Cl. 219-137.00R.

Feder, Alvin, to Motorola, Inc. Multi-position switch with single sliding actuator cam, reciprocable cam follower and compressive conductive elastomer. 4,114,000, Cl. 200-16.00R.

Feldman, Charles L.; and Hubelbank, Mark, to Electronics for Medicine, Inc. Apparatus and method for ECG baseline shift detecting. 4,112,930, Cl. 128-2.06R.

Feldmar Products, Inc.: *See*—
Booty, Donald J., 4,114,098, Cl. 325-390.000.

Felix, Rolf: *See*—
Fleisch, Herbert A.; and Felix, Rolf, 4,113,861, Cl. 424-204.000.
Fleisch, Herbert A.; and Felix, Rolf, 4,113,862, Cl. 424-204.000.

Fellows, Ronald John: *See*—
Palfrey, Lesley Francis; and Fellows, Ronald John, 4,112,589, Cl. 34-48.000.

Feltz, Albert J.; and Deck, Howard C., to Singer Company, The. Automatic lower loop restorer mechanism. 4,113,368, Cl. 352-159.000.

Fernandez, Maria del Carmen: *See*—
Fernandez, Santiago Julio; and Fernandez, Maria del Carmen, 4,112,595, Cl. 35-35.00E.

Fernandez, Santiago Julio; and Fernandez, Maria del Carmen. Teaching devices. 4,112,595, Cl. 35-35.00E.

Ferrara, Louis Thomas; and Roccisano, Janet. Blood collection valve. 4,112,924, Cl. 128-2.00F.

Ferrarese, Frank L.: *See—*
Bush, Austin R.; and Ferrarese, Frank L., 4,113,089, Cl. 206-319.000.

Ferraris, Giuseppe: *See—*
Cesca, Sebastiano; Priola, Aldo; and Ferraris, Giuseppe, 4,113,790, Cl. 260-683.15B.

Ferrentino, Antonio; and Brovedan, Antonio, to Industrie Pirelli Societa per Azioni. Apparatus for laying-up together a plurality of fragile filaments. 4,112,660, Cl. 57-59.000.

Ferri, John L.; Mathers, James E.; and Yale, Ramon L., to GTE Sylvania Incorporated. Terbium-activated rare earth oxysulfide phosphors with controlled decay. 4,113,648, Cl. 252-301.40S.

Fesquet, Amedee. Machinery for the mass production of pronged members or of continuous strips of pronged members. 4,112,674, Cl. 59-72.000.

Fibre Containers Company: *See—*
Scott, Donald M., 4,113,096, Cl. 206-523.000.

Fidler, Gary L.; Hill, Richard A.; and Carrera, John P., to Westinghouse Electric Corp. Valve arrangement for a nuclear plant residual heat removal system. 4,113,561, Cl. 176-38.000.

Fiedler, Howard C., to General Electric Company. Method of producing silicon-iron sheet material with copper as a partial substitute for sulfur, and product. 4,113,529, Cl. 148-111.000.

Fiege, Helmut; Haydn, Josef; Renner, Johann; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Process for purifying alkylphenolz. 4,113,975, Cl. 568-756.000.

Fields, Ernest E.; and Reineck, Lester W., to Outboard Marine Corporation. Liquid tank cap having a vent. 4,113,138, Cl. 220-367.000.

Filianovich, Jevgeny Grigorievich: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, 4,113,287, Cl. 285-137.00R.

Filmon Process Corp.: *See—*
Ploeger, Walter, Jr., 4,113,392, Cl. 400-240.100.

Filtertek, Inc.: *See—*
Leason, Hayden L., 4,113,627, Cl. 210-446.000.

Filzinger, Klaus: *See—*
Fuchs, Hermann; and Filzinger, Klaus, 4,113,719, Cl. 260-149.000.

Finike Italiana Marposs Soc. in Accomandita Semplice di Mario Possati & C.: *See—*
Possati, Mario, 4,112,629, Cl. 51-165.930.

Finn, James J., to Diagnostic Isotopes Incorporated. Ampule capable of being autoclaved. 4,113,097, Cl. 206-528.000.

Fiorenza, Giorgio, to Ing. C. Olivetti & C., S.p.A. Electronic desk-top accounting machine and calculator. 4,114,026, Cl. 235-375.000.

Firmenich & Cie: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,113,891, Cl. 426-536.000.

Fischer, Adolf, deceased (by Fischer, Caecilia Emma, heiress-at-law); and Hamprecht, Gerhard, to BASF Aktiengesellschaft. N',N'-disubstituted 2,1,3-benzothiadiazin-(4)-one-2,2-dioxides. 4,113,939, Cl. 544-11.000.

Fischer, Caecilia Emma, heiress-at-law: *See—*
Fischer, Adolf, deceased; and Hamprecht, Gerhard, 4,113,939, Cl. 544-11.000.

Fischer & Porter Company: *See—*
Hermanns, Henry M., 4,112,960, Cl. 137-85.000.

Fischer, Robert Bowlby: *See—*
Larson, John Arden; and Fischer, Robert Bowlby, 4,113,527, Cl. 148-36.000.

Fister, Julius C., Jr.; Breedis, John F.; and Pryor, Michael J., to Swiss Aluminium Ltd. High strength aluminum extrusion alloy. 4,113,472, Cl. 75-142.000.

Fitzmayer, Louis H.: *See—*
Simon, Donald J.; and Fitzmayer, Louis H., 4,114,013, Cl. 219-10.55D.

Fitzsimmons, William A.; and Lawler, James E., to Fitzsimmons, William A. Device for determining angles. 4,112,580, Cl. 33-174.00S.

Flament, Ivon: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,113,891, Cl. 426-536.000.

Flanagan, Joseph E.: *See—*
Grant, Louis R.; and Flanagan, Joseph E., 4,113,775, Cl. 260-564.00G.

Flaum, Dennis Michael; and Fleishman, Herman Lawrence. Zipper construction. 4,112,556, Cl. 24-205.10R.

Fleisch, Herbert A.; and Felix, Rolf, to Procter & Gamble Company, The. Phosphonate pharmaceutical composition. 4,113,861, Cl. 424-204.000.

Fleisch, Herbert A.; and Felix, Rolf, to Procter & Gamble Company, The. Carboxy phosphonate pharmaceutical composition. 4,113,862, Cl. 424-204.000.

Fleischer, Henry. Clamping device. 4,113,285, Cl. 285-45.000.

Fleishman, Herman Lawrence: *See—*
Flaum, Dennis Michael; and Fleishman, Herman Lawrence, 4,112,556, Cl. 24-205.10R.

Fletcher, Samuel G.; and McCutcheon, Martin J. Pseudo palate useful for diagnosis and treatment of speech impairment. 4,112,596, Cl. 35-35.00R.

Flodman, Leif A.: *See—*
Nyren, Jan O.; Nordin, Soren B.; and Flodman, Leif A., 4,113,555, Cl. 162-127.000.

Flower, Robert J.; Snedeker, Clarke R.; and Beatenbough, Paul K., to General Motors Corporation. Recuperator. 4,113,007, Cl. 165-81.000.

FMC Corporation: *See—*
Gerow, Gordon P., 4,113,573, Cl. 203-2.000.

Fohl, Artur, to Repa Feinstanzwerk GmbH. Safety device for arresting unrolling of roller blinds. 4,112,996, Cl. 160-296.000.

Fono, Andrew; and Patton, Ray F., to Royce Chemical Company. Process for dyeing cellulosic textiles with vat and sulfur dyes. 4,113,427, Cl. 8-34.000.

Fontanilles, Henry: *See—*
Burns, Donald Arthur; and Fontanilles, Henry, 4,113,383, Cl. 356-36.000.

Food Automation-Service Techniques, Inc.: *See—*
Koether, Bernard G.; and Shaughnessy, William J., 4,113,623, Cl. 210-167.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. End loaded carton with automatic header. 4,113,086, Cl. 206-45.140.

Ford, John Charles, to Girling Limited. Hydraulically operated disc brakes. 4,113,068, Cl. 188-72.500.

Ford, Michael Alan; Mould, Henry Manifold; and Kolb, Dieter. Transient suppressor network for spectrophotometers and the like. 4,113,385, Cl. 356-96.000.

Ford, Michael Alan. Tunable electrical filter network. 4,114,117, Cl. 333-70.0CR.

Forg, Wolfgang, to Linde Aktiengesellschaft. Liquefaction of natural gas. 4,112,700, Cl. 62-28.000.

Forlini, Matthew: *See—*
Saxe, Robert L.; Thompson, Robert I.; and Forlini, Matthew, 4,113,362, Cl. 350-362.000.

Forrest, William J. Livestock transport apparatus. 4,112,874, Cl. 119-158.000.

Forward, Cleve H.; and Higgins, Jerry G. Alkyl vinyl copolymer. 4,113,668, Cl. 521-60.000.

Foss, Richard W., to Jos. Dyson & Sons, Inc. Lift fork construction. 4,113,128, Cl. 214-750.000.

Fox, Richard C.: *See—*
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,113,525, Cl. 148-23.000.
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,113,526, Cl. 148-23.000.

Fraas, Lewis M.: *See—*
Zanio, Kenneth W.; and Fraas, Lewis M., 4,113,531, Cl. 148-174.000.

Frank, Earl E.; and Yee, Bing S., to Abex Corporation. Hydraulic apparatus. 4,113,621, Cl. 210-167.000.

Franks, Lawrence A.; Stroup, Steven L.; and Perry, James E., to Burr Oak Tool & Gauge Company. Tube cutter with phase changer. 4,112,794, Cl. 82-64.000.

Franson, David C.: *See—*
Hoffman, Robert K.; and Franson, David C., 4,112,968, Cl. 137-427.000.

Frantz, Virgil L., to Graham-White Sales Corp. Compressed gas filter assembly. 4,113,451, Cl. 55-162.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft M.B.H.: *See—*
Theurer, Josef; Praschl, Wilhelm; and Riessberger, Klaus, 4,113,111, Cl. 212-28.000.

Fraser, Lawrence J.; and Liebman, Alan, to Xerox Corporation. Color development system. 4,113,371, Cl. 355-4.000.

Frazier, Albert A.; and Phillips, Howard W., to Aladdin Industries, Incorporated. Vacuum bottle with air pump to pressurized bottle to effect dispensing. 4,113,147, Cl. 222-131.000.

Freisler, Erhard, to Ruti Machinery Works Ltd. Device for feeding pile warp yarns for pile fabric looms. 4,112,981, Cl. 139-102.000.

Freudenschuss, Otto, to Vockenhuber, Karl; and Hauser, Raimund. Method of and system for measuring distances. 4,113,382, Cl. 356-5.000.

Frey, Hans-Helmut; and Klug, Helmut, to Hoechst Aktiengeselischaft. Thermoplastic compositions comprising PVC and chlorinated polyethylene. 4,113,805, Cl. 260-897.00C.

Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, to Wacker-Chemie GmbH. Preparation of organopolysiloxane polymers. 4,113,760, Cl. 260-448.20E.

Friedell, Morley V. Oscillation damping pressure relief valve. 4,112,970, Cl. 137-489.500.

Friedli, Hans R.: *See—*
Strojny, Edwin J.; Friedli, Hans R.; and Wing, Milton S., 4,113,745, Cl. 260-346.750.

Frielingsdorf, Hans: *See—*
Schweier, Gunther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, 4,113,933, Cl. 526-124.000.

Friese, Axel; and Simon, Stefan, to Dr. Carl Hahn G.m.b.H. Apparatus for transferring a deformable cylindrical work piece from one work station to another. 4,113,083, Cl. 198-480.000.

Frink, Russell E.; and Milianowicz, Stanislaw A., to Westinghouse Electric Corp. Quick-acting movable operating-column tripping device. 4,114,003, Cl. 200-144.00R.

Frinzel, Jerry C. Intravenous pole. 4,113,222, Cl. 248-412.000.

Fritsch, Robert A.; Gattu, Narahari; and Vaerk, Lembit, to Harnischfeger Corporation. Boom section for telescopic crane boom. 4,112,649, Cl. 52-731.000.

Frituz, Bela: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef;

Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, 4,113,287, Cl. 285-137.00R.

Fritzler, Ulrich M., to Fritzler, Ulrich M. Roof reflective polygon scanning apparatus. 4,113,367, Cl. 352-105.000.

Fritzsche, Gunther: *See*—
Affeldt, Karl-Heinz; Fritzsche, Gunther; Ganzke, Joachim; and Raupach, Gerhard, 4,112,929, Cl. 128-2.05M.

Fry, James H., Jr. Power circuit identifier which produces a voltage pulse in response to interruption of power. 4,114,092, Cl. 324-66.000.

Fry, Michael George Joseph, to Brentford Electric Limited. Magnetic or electric measuring devices. 4,114,087, Cl. 324-0.50E.

Frye, James A. Rotary plug valve. 4,113,228, Cl. 251-159.000.

Fu, Horng-sen; Holloway, Thomas C.; Tasch, Al F., Jr.; and Chatterjee, Pallab K., to Texas Instruments Incorporated. Fabrication methods for the high capacity ram cell. 4,112,575, Cl. 29-577.00C.

Fuchs, Hermann; and Filzinger, Klaus, to Hoechst Aktiengesellschaft. 1:2-Cobalt-complex azo dyestuffs having an acetoacetylamino diphenylamino coupler. 4,113,719, Cl. 260-149.000.

Fudman, Israel. Device for shaving ice. 4,113,190, Cl. 241-92.000.

Fuhrman, Gunther Georg; Krogmann, Uwe Jonny; and Schroth, Gerhard Wolfgang. Ash removal equipment arranged on a lifting mechanism for pulverized-coal furnaces of large-capacity steam generators. 4,112,856, Cl. 110-165.00R.

Fuji Photo Film Co., Ltd.: *See*—
Sato, Masamichi, 4,113,486, Cl. 96-36.000.
Sato, Masamichi; and Fujii, Itsuo, 4,113,492, Cl. 96-67.000.
Shishido, Tadao; Hara, Hiroshi; and Arai, Atsuaki, 4,113,495, Cl. 96-100.00R.
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, 4,113,489, Cl. 96-60.00R.
Yamada, Minoru; Shishido, Tadao; and Arai, Atsuaki, 4,113,488, Cl. 96-56.000.

Fuji Telecasting Co., Ltd.: *See*—
Itoh, Hiroyuki; Mitsuhashi, Kenhachi; and Akashi, Hiromitsu, 4,112,746, Cl. 73-95.000.

Fujii, Itsuo: *See*—
Sato, Masamichi; and Fujii, Itsuo, 4,113,492, Cl. 96-67.000.

Fujimoto, Keimei: *See*—
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, 4,113,864, Cl. 424-225.000.

Fujimura, Syunichi: *See*—
Hagiwara, Miyuki; Araki, Kunio; Matsuoka, Shingo; and Fujimura, Syunichi, 4,113,595, Cl. 204-159.170.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,113,940, Cl. 544-16.000.

Fujita, Masanori; and Suzuki, Sukenori, to Kabushiki Kaisha Seikosha. Electrically conductive adhesive connecting arrays of conductors. 4,113,981, Cl. 174-88.00R.

Fujita, Takeshi: *See*—
Mori, Shigeo; and Fujita, Takeshi, 4,113,667, Cl. 521-163.000.

Fujita, Tsuguto: *See*—
Harada, Masaaki; and Fujita, Tsuguto, 4,113,379, Cl. 355-71.000.

Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, to Mitsubishi Chemical Industries, Ltd.; and Seikagaku Kogyo Co., Ltd. Process for the renewal of an insolubilized glucose isomerase. 4,113,568, Cl. 195-68.000.

Fujitsu Limited: *See*—
Nojiri, Shoji; Kanzaki, Hisao; Yasoshima, Nobuyuki; Satake, Yasuo; and Ogawa, Kenichi, 4,113,990, Cl. 179-84.00R.
Yamaguchi, Hisashi; Sato, Seii; Iemori, Toshiaki; and Andoh, Shizuo, 4,114,069, Cl. 315-169.0TV.

Fujiwa Kika Kabushiki Kaisha: *See*—
Sato, Jiro, 4,112,998, Cl. 164-136.000.

Fujiwara, Katsuji. Spherical valve assembly. 4,113,229, Cl. 251-174.000.

Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, to Konishiroku Photo Industry Co., Ltd. Method for processing light-sensitive silver halide photographic materials. 4,113,490, Cl. 96-60.00R.

Fukuda, Kazumasa: *See*—
Tokuoka, Yasumichi; and Fukuda, Kazumasa, 4,113,528, Cl. 148-105.000.

Fukuda, Mataharu, to Nippon Cable Systems Inc. Flexible drive cable. 4,112,708, Cl. 64-2.00R.

Fukunaka, Shiro: *See*—
Uchida, Kuniki; Araki, Kenzi; Narita, Hirosi; Fukunaka, Shiro; and Kurihara, Takao, 4,113,523, Cl. 148-12.300.

Fukushima, Keitaro; Kusunose, Takamaro; and Nosaka, Yoshinori, to Japan Exlan Company Limited. Process for producing carbon fibers. 4,113,847, Cl. 423-447.400.

Fukuta, Shigemi; Izaki, Hiroshi; and Yoshino, Shoichi, to Kubota, Ltd. Chill preventing arrangement for use in centrifugal casting and method for preventing chill thereby. 4,113,002, Cl. 164-286.000.

Funakoshi, Satoshi, to Green Cross Corporation, The. HBsAG Particle composed of single polypeptide subunits and the preparation procedure. 4,113,712, Cl. 260-112.00R.

Funakoshi, Satoshi; and Oomura, Takao, to Green Cross Corporation, The. Haptoglobin insolubilized by being fixed in fibrin. 4,113,853, Cl. 424-78.000.

Fundom, Danny L.: *See*—
Dietz, Raymond A. F.; Fundom, Danny L.; Henning, George J.; and McKinney, Lynn B., 4,113,095, Cl. 206-508.000.

Funk, Clarence J., to United States of America, Navy. Acoustic device. 4,114,135, Cl. 340-2.000.

Furia, Arnold. Folding attachment for bicycles. 4,113,271, Cl. 280-287.000.

Furia, Thomas Edward: *See*—
Bellanca, Nicolo; and Furia, Thomas Edward, 4,113,505, Cl. 106-137.000.

Furugard, Erik: *See*—
Brosow, Jorgen; and Furugard, Erik, 4,114,032, Cl. 235-493.000.

Furukawa, Akio, to Ricoh Company, Ltd. Flash mechanism for camera. 4,114,170, Cl. 354-149.000.

Furukawa Electric Company Limited, The: *See*—
Hagiwara, Miyuki; Araki, Kunio; Matsuoka, Shingo; and Fujimura, Syunichi, 4,113,595, Cl. 204-159.170.

Furuya, Nobuo: *See*—
Itoh, Tsutomu; Furuya, Nobuo; and Ohuchi, Kenji, 4,112,869, Cl. 118-623.000.

Fuse, Takeshi; Yajima, Toshio; Hino, Isao; and Oka, Shohei, to Osaka Prefectural Office. Apparatus for hanging a board. 4,113,216, Cl. 248-204.000.

G. D. Searle & Co.: *See*—
Schlatter, James M.; and Goodmonson, Owen, 4,113,713, Cl. 260-112.50R.

G. Duesterloh GmbH: *See*—
Klie, Jurgen, 4,112,973, Cl. 137-625.210.

Gabler, Josef: *See*—
Chrtek, Milan; Gabler, Josef; Tuma, Frantisek; Kasparek, Karel; and Blasko, Jan, 4,112,663, Cl. 57-58.890.

Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, to Rohm GmbH. Method of making carbonic acid esters. 4,113,762, Cl. 260-463.000.

Gaertner, Waldemar, to Siemens Aktiengesellschaft. Arrangement for directional radiation of light in symbol-indicator systems. 4,113,347, Cl. 350-96.240.

Gaessler, Henri Pierre: *See*—
Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, 4,113,596, Cl. 204-180.00R.

GAF Corporation: *See*—
Tracy, David J.; and Hoffstadt, Walter F., 4,113,954, Cl. 548-365.000.

Gai-Tronics Corporation: *See*—
Day, Paul B., 4,113,985, Cl. 179-2.00R.

Gale, Preston L.: *See*—
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., 4,113,920, Cl. 428-565.000.

Gallagher Electronics Limited: *See*—
Gallagher, William Murray, 4,114,185, Cl. 361-232.000.

Gallagher, William Murray, to Gallagher Electronics Limited. Electric fence controllers. 4,114,185, Cl. 361-232.000.

Gambro AG: *See*—
Riede, Gerhard, 4,113,625, Cl. 210-321.00B.

Games Research Associates: *See*—
Sain, Paul E., 4,113,260, Cl. 273-245.000.

Gansfried, Myles Stephen, to U.S. Philips Corporation. Cable-supporting arrangement for X-ray tomographic scanner. 4,114,043, Cl. 250-445.00T.

Ganske, Kingston; Hibbard, Earl R.; Falk, Mervin L.; and Denk, Joseph P., to Insurance Technology Company. Recording system with gas supported record medium. 4,114,183, Cl. 360-99.000.

Ganzke, Joachim: *See*—
Affeldt, Karl-Heinz; Fritzsche, Gunther; Ganzke, Joachim; and Raupach, Gerhard, 4,112,929, Cl. 128-2.05M.

Gardiner, John B.: *See*—
Engel, Lawrence J.; and Gardiner, John B., 4,113,636, Cl. 252-51.50R.

Gardner, Derek Victor, to Beecham Group Limited. Tetrahydroisoquinoline basic ethers and pharmaceutical compositions and methods employing them. 4,113,869, Cl. 424-258.000.

Gardziella, Arno; and Jellinek, Karl, to Rutgerswerke Aktiengesellschaft. Method of applying powder coatings of unsaturated branched hydroxyester resins. 4,113,898, Cl. 427-195.000.

Garehime, Jacob W., Jr. Surveillance and weapon system. 4,112,818, Cl. 89-41.0TV.

Garin, John; and Belsick, James C., to United States of America, Energy. Core disruptive accident margin seal. 4,113,564, Cl. 176-87.000.

Garin, Torunn Atteraas: *See*—
Kramer, Franklin; Henig, Yair Steve; Garin, Torunn Atteraas; and Vogel, Gerald James, 4,113,887, Cl. 426-422.000.

Garsky, Victor M.; and McGregor, William H., to American Home Products Corporation. [Des-Ala^1, Gly^2-desamino-Cys^3]somatostatin. 4,113,714, Cl. 260-112.50S.

Gartner, Klaus W.: *See*—
Uyeda, Tim M., 4,112,715, Cl. 70-38.00A.

Gas Developments Corporation: *See*—
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 4,113,004, Cl. 165-3.000.

Gasper, Stephen A., to Roberts Corporation. Conveyor control system. 4,112,999, Cl. 164-154.000.

Gates, John William Charles; Hall, Roy Geoffrey Noel; Ross, Ian Norman; and Stevens, Richard Frederick, to National Research Development Corporation. Optical apparatus for determining relative positioning of two members. 4,113,388, Cl. 356-110.000.

Gates, Michael. Multiple implement folding hitch. 4,113,273, Cl. 280-413.000.
Gattu, Narahari: *See—*
Fritsch, Robert A.; Gattu, Narahari; and Vaerk, Lembit, 4,112,649, Cl. 52-731.000.
Gaudiani, Vincent A.: *See—*
Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., 4,112,952, Cl. 128-418.000.
Gauron, Richard F.; and Laconte, Susana S., to Marketing Masters. Latch. 4,113,292, Cl. 292-165.000.
Gautschi, Fritz: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,113,891, Cl. 426-536.000.
Gauvry, Robert; and Portalier, Robert, to Societe de Vente de l'Aluminium Pechiney. Process for obtaining novel blanks for extrusion by impact. 4,113,473, Cl. 75-148.000.
Gay, Guy R.; and Gay, Neil. Mail box support. 4,113,213, Cl. 248-128.000.
Gay, Neil: *See—*
Gay, Guy R.; and Gay, Neil, 4,113,213, Cl. 248-128.000.
GD Anker Gebirgs-Dubel-Anker GmbH & Co. KG: *See—*
Gruber, Rudolf, 4,112,694, Cl. 405-150.000.
Gebauer, Herbert: *See—*
Kubens, Rolf; and Gebauer, Herbert, 4,113,014, Cl. 166-295.000.
Gehringer, Ronald F.: *See—*
Conger, William H.; and Gehringer, Ronald F., 4,112,820, Cl. 70-363.000.
Geis, David G.; and Hodne, Ingard B., to Teletype Corporation. System for mounting an armature. 4,114,126, Cl. 335-270.000.
Gemp, Robert S.: *See—*
Hull, Robert E.; and Gemp, Robert S., 4,114,048, Cl. 307-53.000.
General Battery Corporation: *See—*
Nees, John; and Pike, Kenneth, 4,113,476, Cl. 75-166.00C.
Nees, John; and Pike, Kenneth, 4,113,477, Cl. 75-166.00C.
General Binding Corporation: *See—*
Giulie, Joe D., 4,112,603, Cl. 40-2.00R.
General Electric: *See—*
Lee, Gim Fun, Jr., 4,113,800, Cl. 260-876.00B.
General Electric Company: *See—*
Bochan, John, 4,112,767, Cl. 74-217.00R.
Faulkenberry, Wayne J.; and Riviere, Henry W., 4,114,108, Cl. 330-207.00P.
Fiedler, Howard C., 4,113,529, Cl. 148-111.000.
Horvay, Julius B., 4,114,065, Cl. 312-214.000.
Lee, Gim Fun, Jr., 4,113,797, Cl. 260-876.00B.
Mark, Victor, 4,113,695, Cl. 260-45.80N.
Mark, Victor; and Hedges, Charles Vernon, 4,113,974, Cl. 568-750.000.
Simon, Donald J.; and Fitzmayer, Louis H., 4,114,013, Cl. 219-10.55D.
Wambach, Allen Dale, 4,113,692, Cl. 260-40.00R.
General Foods Corporation: *See—*
Henig, Yair Steve; and Purohit, Kailash S., 4,113,888, Cl. 426-422.000.
Katz, Saul Norman, 4,113,886, Cl. 426-422.000.
Kramer, Franklin; Henig, Yair Steve; Garin, Torunn Atteraas; and Vogel, Gerald James, 4,113,887, Cl. 426-422.000.
General Kinetics, Incorporated: *See—*
King, Charles A.; and Gutterman, Robert P., 4,113,609, Cl. 209-609.000.
General Motors Corporation: *See—*
Carol, John A., Jr.; and McAlindon, Harold P., 4,114,025, Cl. 235-96.000.
Cataldo, Roy S., 4,112,826, Cl. 92-13.100.
Flower, Robert J.; Snedeker, Clarke R.; and Beatenbough, Paul K., 4,113,007, Cl. 165-81.000.
Gilbert, William F.; and Lucas, Larry D., 4,113,984, Cl. 179-1.0GQ.
Kapanka, Harley L., 4,113,310, Cl. 297-408.000.
Kibler, Roland G., 4,112,886, Cl. 123-103.00R.
Kirsch, Norbert, 4,113,296, Cl. 293-96.000.
Lusa, George; and Mathues, Thomas P., 4,113,073, Cl. 188-364.000.
Mann, Gamdur S., 4,112,577, Cl. 29-611.000.
Smith, Stanley E., 4,113,396, Cl. 403-138.000.
Spaulding, James R., 4,112,891, Cl. 123-117.00A.
Sutton, Stephen J.; Holen, J. Robert; and Creager, John E., 4,114,130, Cl. 338-33.000.
Walker, Frank H., 4,113,075, Cl. 192-3.310.
Genovese, David L.: *See—*
Baio, Alfred R.; and Genovese, David L., 4,114,028, Cl. 235-458.000.
Georg Fischer Aktiengesellschaft: *See—*
Hofmann, Franz; and Szatmari, Franz, 4,113,238, Cl. 366-56.000.
George Koch Sons, Inc.: *See—*
Koch, Robert L., II, 4,113,894, Cl. 427-44.000.
Gera, Lajos: *See—*
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, 4,113,868, Cl. 424-251.000.
Gerber Garment Technology, Inc.: *See—*
Pearl, David R., 4,112,797, Cl. 83-177.000.
Gerndt, Christian, to Siemens Aktiengesellschaft. Branching arrangement for communication transmission links having optical glass fibers. 4,113,345, Cl. 350-96.150.
Gerow, Gordon P., to FMC Corporation. Method of and apparatus for steam stripping immiscible materials. 4,113,573, Cl. 203-2.000.
Gettert, Hans; Jeck, Arnulf; and Werner, Dietmar, to Texaco Development Corporation. Process for the partial oxidation of liquid hydrocarbonaceous fuels. 4,113,445, Cl. 48-197.00R.
Geus, John W., to Stamicarbon, N.V. Process for homogeneous deposition precipitation of metal compounds on support or carrier materials. 4,113,658, Cl. 252-454.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Grisebach, Hans Theodor, 4,112,680, Cl. 60-538.000.
Temme, Helmut, 4,113,084, Cl. 198-731.000.
Ghetti, Giuseppe: *See—*
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, 4,113,694, Cl. 260-875.000.
Gibbons, Paul J. Penetrating oil composition. 4,113,633, Cl. 252-11.000.
Gibbs, David James. Exercising apparatus. 4,113,246, Cl. 272-69.000.
Gibby, Mabel K. Needle. 4,113,155, Cl. 223-102.000.
Gilbert, Henry L.; and Van Ordstrand, Cayrl W., to Martin Marietta Aluminum Inc. Armor-piercing incendiary projectile. 4,112,846, Cl. 102-52.000.
Gilbert, William F.; and Lucas, Larry D., to General Motors Corporation. Voltage translating circuit for volume and balance control of a four-channel audio system. 4,113,984, Cl. 179-1.0GQ.
Giles, Dion Ewing: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 4,113,848, Cl. 423-512.00A.
Gillery, F. Howard, to PPG Industries, Inc. Sputtering technique for the deposition of indium oxide. 4,113,599, Cl. 204-192.00P.
Gilomen, Beat, to A. Schild S.A. Operating mechanism for mechanical watch movement. 4,112,673, Cl. 58-85.500.
Ginefra, Anthony, Sr. Clock display device. 4,112,672, Cl. 58-53.000.
Girling Limited: *See—*
Farr, Glyn Phillip Reginald, 4,113,317, Cl. 303-6.00C.
Farr, Glyn Phillip Reginald, 4,114,145, Cl. 340-626.000.
Ford, John Charles, 4,113,068, Cl. 188-72.500.
Harries, David Anthony, 4,112,682, Cl. 60-548.000.
Giubilo, Lauro B. Temporary stopper for outlets of toilet bowls. 4,112,527, Cl. 4-295.000.
Giulie, Joe D., to General Binding Corporation. Luggage tag. 4,112,603, Cl. 40-2.00R.
Giulie, Joe D., to Minnesota Mining and Manufacturing Company. Removable binding device. 4,113,394, Cl. 402-46.000.
Givaudan Corporation: *See—*
Schenk, Hanspeter, 4,113,663, Cl. 252-522.000.
Glaesel, Gottfried, to Hego Electric GmbH. Means for mounting on channel-section supporting rails. 4,113,982, Cl. 174-158.00R.
Glaudel, Stephen P.; and Chambers, Norman T., to Westinghouse Electric Corp. Turbine-generator protection system with electronic sampling filter. 4,114,084, Cl. 322-38.000.
Glaxo Laboratories Limited: *See—*
Laundon, Brian; Cowley, Brian Richard; and Humber, David Cedric, 4,113,591, Cl. 204-158.0HA.
Glazar, Arthur J., to Servo Corporation of America. Hot box detector bearing discriminator circuit. 4,113,211, Cl. 246-169.00A.
Gleockler, Frederick M.; and Gleockler, Robert G. Tree ladder. 4,113,055, Cl. 182-63.000.
Gleockler, Robert G.: *See—*
Gleockler, Frederick M.; and Gleockler, Robert G., 4,113,055, Cl. 182-63.000.
Glover, Ernest. Film projection system. 4,113,366, Cl. 352-8.000.
Glueck, Robert D. Lift for dragged implement. 4,113,028, Cl. 172-178.000.
Glumac, Nick P., to Toter-Tee, Inc. Loading arrangement. 4,113,118, Cl. 214-10.50R.
Glushkov, Alexandr Ivanovich; Krutov, Sergei Vasilievich; Semenov, Vladimir Ivanovich; and Gusev, Anatoly Fedorovich. Automatically adjustable cutting apparatus for purposes such as filleting fish. 4,112,547, Cl. 17-57.000.
Godwin, Robert H.; and Collignon, Herbert E., to Bliss & Laughlin Industries Incorporated. Adjustable gas cylinder chair control. 4,113,220, Cl. 248-400.000.
Gohm, William G., to Westinghouse Electric Corp. Magnetic pipe cleaner. 4,113,611, Cl. 209-215.000.
Goldfarb, Adolph E.; Benkoe, Erwin, deceased (by Benkoe, Elizabeth, executrix); and Robinson, Don, to Goldfarb, Adolph E.; and Benkoe, Elizabeth, executrix for the estate of Erwin Benkoe. Toy game for moving an object up an inclined surface. 4,113,255, Cl. 273-108.000.
Goldman, Irving M.: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,113,891, Cl. 426-536.000.
Goldsborough, Robert R.; Spencer, David R.; and West, Samuel F., to United States of America, Army. Frequency shift rate detector. 4,114,156, Cl. 343-112.00S.
Goldstein, Jonathan R.; and Klein, Yitzhak. Secondary cells. 4,113,921, Cl. 429-27.000.
Golembeck, Gerald A.; and Horwitz, Thomas L., to United States Bedding Company, The. Foundation unit for bedding. 4,112,529, Cl. 5-354.000.
Goletz, Edward, Jr.: *See—*
Lonstrup, Thorkild F.; Brownawell, Darrell W.; Goletz, Edward, Jr.; and Numair, Solomon J., 4,113,639, Cl. 252-51.50A.
Golf Resources, Ltd.: *See—*
Beery, Peter W., 4,113,249, Cl. 273-78.000.
Gollel, Richard M. Coin operated ultrasonic cleaning device. 4,112,955, Cl. 134-57.00R.
Gomi, Teruo; Hisa, Yuji; and Soeda, Takahiko, to Ajinomoto Co., Inc. Process for preparing improved soy protein materials. 4,113,716, Cl. 260-123.500.

Gondos, Gyorgy: *See*—
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, 4,113,868, Cl. 424-251.000.

Goodmonson, Owen: *See*—
Schlatter, James M.; and Goodmonson, Owen, 4,113,713, Cl. 260-112.50R.

Goodyear Aerospace Corporation: *See*—
Haney, James Richard, 4,113,323, Cl. 303-115.000.

Goodyear Tire & Rubber Company, The: *See*—
Brown, Jack E., Jr., 4,112,630, Cl. 51-281.00R.

Goransson, Lars Roland; van Oorschot, Gosewinus Franciscus; and Pittoors, Jan Gustaaf, to Atlas Copco Aktiebolag. Method and device relating to separation of liquid from liquid-containing compressed gas. 4,113,450, Cl. 55-97.000.

Gorbaty, Martin L.; Tao, Frank F.; and Maa, Peter S., to Exxon Research & Engineering Co. Integrated process for the production of hydrocarbons from coal or the like in which fines from gasifier are coked with heavy hydrocarbon oil. 4,113,602, Cl. 208-8.000.

Gorbaty, Martin L., to Exxon Research & Engineering Co. Method for obtaining substantially complete removal of phenols from waste water. 4,113,615, Cl. 210-40.000.

Gordon, Ronald S.: *See*—
Virkar, Anil V.; Miller, Mark L.; Cutler, Ivan B.; and Gordon, Ronald S., 4,113,928, Cl. 429-193.000.

Gorham, Michael L.; and Norian, Roger F., to Xerox Corporation. Automatic dialer having a selective retry capability. 4,113,991, Cl. 179-90.00B.

Gorham, Michael L.; Heckman, Raymond F.; and Yole, Charles S., to Xerox Corporation. Automatic dialer for facsimile terminals and the like. 4,113,992, Cl. 179-90.00B.

Goryachev, Vladimir Ilich; Kotelnikov, Grigory Vladimirovich; and Makurin, Pavel Semenovich. Differential scanning microcalorimeter. 4,112,734, Cl. 73-15.00B.

Gosselin, Yvon. Hydraulic log splitter implement. 4,112,985, Cl. 144-193.00A.

Goto, Kenji; and Niwa, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine. 4,112,877, Cl. 123-32.0ST.

Goto, Yorinobu: *See*—
Koike, Sakae; Matsunami, Shoichi; Goto, Yorinobu; and Tanabe, Yoshio, 4,113,838, Cl. 423-235.000.

Gouldson, Eric John: *See*—
Pound, Thomas Charles; and Gouldson, Eric John, 4,113,534, Cl. 156-56.000.

Graef, Harry T.; Richardson, Jack M.; and Wolfarth, Robert P., to Diebold Incorporated. Sealed tamper-indicating money dispensing containers for automatic banking systems. 4,113,140, Cl. 221-6.000.

Grafe, Robert Joseph: *See*—
Boyd, William Weller; Grafe, Robert Joseph; and Pingry, Carl Oscar, III, 4,114,139, Cl. 340-147.00R.

Graham-White Sales Corp.: *See*—
Frantz, Virgil L., 4,113,451, Cl. 55-162.000.

Gram, Donald J., to University of California, The Regents of the. Method for resolving amino and ammonium compounds. 4,113,959, Cl. 560-38.000.

Gramling, William Dwight. Casing stop for well tools and an insertion device therefore. 4,113,010, Cl. 166-213.000.

Granges Essem Aktiebolag: *See*—
Beland, Stig Gosta Bele, 4,113,062, Cl. 185-10.000.

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Covington, Wayne L.; and Green, Glen R., 4,112,545, Cl. 17-45.000.

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Green, Russell W. Method of and means for mounting labels. 4,113,538, Cl. 156-247.000.

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Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Joseph M., to Gregg Engineering Corp. Combination web tucker and knife with web grippers and anvil. 4,113,243, Cl. 270-21.000.

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Greiser, John W., to Transco Products, Inc. Broadband spiral antenna. 4,114,164, Cl. 343-895.000.

Grenfell, Hugh W.; Bowen, David J.; and Baker, Robert, to British Steel Corporation. Refining molten metal. 4,113,469, Cl. 75-60.000.

Grenier, Aime J., to Texas Instruments Incorporated. Circuit breaker. 4,114,122, Cl. 335-8.000.

Grenier, Aime J., to Texas Instruments Incorporated. Circuit breaker. 4,114,123, Cl. 335-42.000.

Greubel, Waldemar: *See*—
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Greven, Johann; and Mostert, Johann, to Schumag Schumacher Metallwerke Gesellschaft mit beschrankter Haftung. Carriage drawing machine for uniformly drawing elongated material to be drawn. 4,112,730, Cl. 72-290.000.

Griesshammer, Rudolf: *See*—
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Griffin, William. Muzzle loading device. 4,112,606, Cl. 42-90.000.

Grisebach, Hans Theodor, to Gewerkschaft Eisenhutte Westfalia. Control systems and arrangements for mineral mining installations. 4,112,680, Cl. 60-538.000.

Grode, Gerald Arthur; Boggs, Daniel Roy; and Wright, James Irvin, to Baxter Travenol Laboratories, Inc. Flexible collapsible blood freezing containers. 4,112,989, Cl. 150-1.000.

Gross, Harry Robert. Method of making a switch. 4,112,576, Cl. 29-602.00R.

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Grundig E.M.V.: *See*—
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Guglia, Gaston; and Lupien, Jacques. Capped fuel tank funnel. 4,112,984, Cl. 141-98.000.

Guibert, Raul. Hot air oven for food-loaded cartridges. 4,112,916, Cl. 126-261.000.

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Haarhoff, Pierre Cloete; and Schumann, Werner Adolf, to Atomic Energy Board. Gas separation process and treatment of a gas in a gas separation process. 4,113,448, Cl. 55-17.000.
Habert, Roger, to Ducellier et Cie. Electronic distribution and control device for the ignition of internal combustion engines, particularly for motor vehicles. 4,112,895, Cl. 123-117.00R.
Hachiga, Takasi: *See*—
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Hagiwara, Miyuki; Araki, Kunio; Matsuoka, Shingo; and Fujimura, Syunichi, to Japan Atomic Energy Research Institute; and Furukawa Electric Company Limited, The. Process for producing molded product composed of crosslinked resin or crosslinked-resin coated material on a substrate by means of electron beam. 4,113,595, Cl. 204-159.170.
Hagner, Clifford K.; and Wissel, Richard B., to Procter & Gamble Company, The. Article for conditioning fabrics. 4,113,630, Cl. 252-8.600.
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Hall, George A., III: *See*—
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Harada, Masaaki; and Fujita, Tsuguto, to Rank Xerox, Ltd. Illumination apparatus for electronic copying machines. 4,113,379, Cl. 355-71.000.
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Hardies, Donald E.; and Rinehart, Jay K., to PPG Industries, Inc. Control of pathogenic fungi with fluorinated carbonates. 4,113,878, Cl. 424-301.000.
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Hasson, Victor Haim; and von Bergmann, Hubertus Michael, to South African Inventions Development Corporation, The. Laser and its method of operation. 4,114,113, Cl. 331-94.50G.
Hatcher, Charles S.; and Smith, Kenneth E., to Phillips Petroleum

Company. Apparatus and process suitable for twist-drawing a yarn. 4,112,667, Cl. 57-157.00S.
Hattori, Tadashi: *See—*
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Hayward, Alan Thomas Joseph, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Flowrate meters. 4,112.757, Cl. 73-207.000.
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Heitland, Herbert; and Renger, Udo, to Volkswagenwerk Aktiengesellschaft. Internal combustion engine with a main combustion chamber and an auxiliary combustion chamber. 4,112,878, Cl. 123-32.0ST.
Held, Manfred; and Spies, Hans, to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung. Releasing device with preset response sensitivity for electrical fuzes for use with mines. 4,112,844, Cl. 102-19.200.
Helfert, Herbert; Davis, Pauls; and Langdon, William Keith, to BASF Wyandotte Corporation. Polyether polyols and method of preparing same. 4,113,785, Cl. 260-615.00B.
Helfgen, Werner; Lindner, Gerhard; Lingens, Paul; and Kaufmann, Helmut, to Dynamit Nobel Aktiengesellschaft. Process for the production of flexible explosive formed charges. 4,113,811, Cl. 264-3.00R.
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Henry, Hubert H. End section for a reciprocating mower. 4,112,655, Cl. 56-301.000.
Henry, Russell Alger; and Summers, Ernest Moreland, to Wear-Cote International, Inc. Method of obtaining electroless nickel coated filled epoxy resin article. 4,113,899, Cl. 427-290.000.
Hensen, Friedhelm: *See—*
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Hensley, William G., to Minnesota Mining and Manufacturing Company. Traverse bar and slide. 4,113,194, Cl. 242-43.00R.
Herbst, Thomas, to Dyckerhoff & Widmann Aktiengesellschaft. Removable press anchor with destructible anchor body. 4,112,637, Cl. 52-155.000.
Herbstman, Sheldon; Webb, Allen N.; and Estes, John H., to Texaco Inc. Alkylation process. 4,113,657, Cl. 252-442.000.
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Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., 4,113,801, Cl. 260-876.00B.
Einerhand, Johan Jozef; Erkens, Leonardus Johannes Hubertus; Laenen, Rene Johannes; and Hoofs, Joseph Wilhelmus Jacobus, 4,113,508, Cl. 106-304.000.
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Hermanns, Henry M., to Fischer & Porter Company. Variable-gradient spring sub-assembly. 4,112,960, Cl. 137-85.000.
Hermanson, Dean E.: *See—*
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Hermes Precisa International S.A.: *See—*
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Herrington, Richard A.: *See—*
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Herschler, Robert J. Method for the treatment of water-living animals with health modifying agents. 4,112,946, Cl. 128-253.000.
Herzog, Gerald Bernard, to RCA Corporation. Position encoder employing charge transfer circuit. 4,114,035, Cl. 250-211.00K.
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., to Pfizer Inc. 15-Substituted-ω-pentanorprostaglandins. 4,113,723, Cl. 260-347.300.
Hess, Hans-Jurgen E., to Pfizer Inc. Oxaprostaglandins. 4,113,766, Cl. 562-503.000.
Hesse, Karl-Heinz: *See—*
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Heuck, Roger W., to M. E. Heuck Company. Grill scraper. 4,112,537, Cl. 15-105.000.
Hewlett-Packard Company: *See—*
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Heyman, Duane A., to Sherwin-Williams Company, The. Process for preparing 2-benzimidazolones. 4,113,952, Cl. 548-305.000.
Hi-Shear Corporation: *See—*
Wing, George S., 4,112,992, Cl. 151-29.000.
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Hile, John R. Code combination property alarm system. 4,114,147, Cl. 340-528.000.
Hill, David Arthur; and Lomnitzer, Abraham. Apparatus for the use in the construction of electric circuits. 4,112,593, Cl. 35-19.00A.
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Hill, Robert W.; Onnen, William G.; and Ryder, Lyle C., to Ames Rubber Corporation. Method of sealing the ends of an elastomeric roll. 4,113,825, Cl. 264-262.000.
Hillman, Edwin K. Solar liquid/air heater. 4,112,920, Cl. 126-271.000.
Hilti Aktiengesellschaft: *See—*
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Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, to Tanabe Seiyaku Co. Ltd. 8-Azaprostanoic acid derivatives. 4,113,873, Cl. 424-274.000.
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Hirota, Nobuyoshi; and Shibata, Akio, to Mitsubishi Jukogyo Kabushiki Kaisha. Coating composition for leak detection in air test. 4,113,673, Cl. 260-8.000.
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Hofmann, Franz; and Szatmari, Franz, to Georg Fischer Aktiengesellschaft. Drum mixer. 4,113,238, Cl. 366-56.000.
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Hollander, Harry. Ultrasonic television remote control system. 4,114,099, Cl. 325-392.000.
Hollingsworth, Richard James, to RCA Corporation. Unbalanced sense circuit. 4,114,055, Cl. 307-362.000.
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Hollymatic Corporation: *See—*
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Holm, LeRoy W.: *See—*
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Hoppen, Heinz; and Fasbender, Heinz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method and apparatus for drying and grinding. 4,113,187, Cl. 241-24.000.
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Horowitz, Charles, to Sloan Valve Company. Tractor protection valve. 4,112,961, Cl. 137-102.000.
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Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,113,957, Cl. 548-377.000.
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Hosoya, Kazuo; and Kubota, Munetaka, to Kajima Kensetsu Kabushiki Kaisha. Method and construction of underground tank well. 4,112,690, Cl. 405-57.000.
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Howard, Robert N., to Minnesota Mining and Manufacturing Company. Encapsulated abrasive grains and articles made therefrom. 4,112,631, Cl. 51-295.000.
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Huber, Leonhard; Kirschner, Helmut; and Muller, Herbert, to Agfa-Gevaert AG. Shutter mechanism. 4,114,175, Cl. 354-252.000.
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Hudelmaier, Gerhard. Device for the control of concrete manufacture in truck concrete mixers. 4,114,193, Cl. 366-2.000.
Hudson, George Elbert, III; and Clark, Arthur E., to United States of America, Navy. Heat transfer system using thermally-operated, heat-conducting valves. 4,112,699, Cl. 62-3.000.
Hufendiek, Ernst-Wilhelm, to Daimler-Benz Aktiengesellschaft. Rotational speed governor for an injection pump in air-compressing injection internal combustion engines. 4,112,897, Cl. 123-139.0ST.
Huff, Peter C. Integrated pneumatic logic module. 4,112,962, Cl. 137-119.000.
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Hugl, Herbert; Schundehutte, Karl Heinz; Trautner, Kersten; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Process for dyeing fibre materials. 4,113,428, Cl. 8-41.00R.
Hulka, Jaroslav Fabian; and Clemens, George Selden, to Research Corporation. Surgical clip. 4,112,951, Cl. 128-346.000.
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Humphrey, William E., to Humphrey Instruments, Inc. Process and apparatus for astigmatic and spherical subjective testing of the eye. 4,113,363, Cl. 351-17.000.
Hunka, George William, to RCA Corporation. Optical cursor tracking correction system. 4,114,034, Cl. 250-202.000.
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Hurst, Thomas L., to A. E. Staley Manufacturing Company. Glucose isomerization with iron ion-thiol activator ion-glucose isomerase systems. 4,113,565, Cl. 195-31.00F.
Huston, Henry H., to Weird Products Ltd. Amusement device requiring concentration and coordination. 4,113,253, Cl. 273-96.00R.
Hutchings, David Roy. Dual nature puzzle pieces. 4,113,256, Cl. 273-160.000.
Hutkin, Irving J. Method of making a thin-copper foil-carrier composite. 4,113,576, Cl. 204-13.000.
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Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury

Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, 4,113,287, Cl. 285-137.00R.

Iida, Hideo, to Nippon Hume Pipe Company Limited. Method of manufacturing prestressed concrete pipe. 4,113,823, Cl. 264-228.000.

Iida, Kazuyoshi: *See—*
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; and Suzuki, Shosuke, 4,113,053, Cl. 181-284.000.

Iijima, Yoo: *See—*
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, 4,113,489, Cl. 96-60.00R.

Ikawa, Reiji, to Tokyo Special Wire Netting Co., Ltd. Distillation column packing. 4,113,810, Cl. 261-98.000.

Ikeda, Masanori: *See—*
Tanabe, Masanori; Ikeda, Masanori; and Tamura, Nobuhiro, 4,113,970, Cl. 560-244.000.

Ikegai Tekko Kabushiki Kaisha: *See—*
Takiura, Mamoru; and Hayashizaki, Yoshihiro, 4,113,822, Cl. 264-349.000.

Ikeguchi, Takashi: *See—*
Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, 4,113,608, Cl. 209-1.000.

Ilieve, Peter John, to Decca Limited. Clamping circuits for television signals. 4,114,179, Cl. 358-34.000.

Illinois Tool Works Inc.: *See—*
Rapata, George M., 4,113,340, Cl. 339-113.00R.

Imai, Nobuo: *See—*
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, 4,113,568, Cl. 195-68.000.

Imai, Toshihiro: *See—*
Yamasita, Nobuo; and Imai, Toshihiro, 4,113,354, Cl. 350-172.000.

IMASCO Limited: *See—*
Poskitt, Walter Edward, 4,114,090, Cl. 324-61.0QS.

Imed Corporation: *See—*
Hyman, Oscar E., 4,114,144, Cl. 340-632.000.

Imes, Jack, Jr., to RB Toy Development Co. Target game. 4,113,251, Cl. 273-95.00R.

Impastato, Leona R. Color coordinating implement. 4,112,594, Cl. 35-28.300.

Imperial Chemical Industries Limited: *See—*
Bagnall, Robert David, 4,113,883, Cl. 424-342.000.
Jones, Geraint; and Thomson, David Summers, 4,113,879, Cl. 424-304.000.
Parton, Brian, 4,113,717, Cl. 260-146.00R.
Price, Brian George, 4,113,803, Cl. 260-885.000.
Rose, John Brewster; and Staniland, Philip Anthony, 4,113,699, Cl. 528-126.000.
Shephard, Margaret Claire; Sugavanam, Balsubramanyan; Worthington, Paul Anthony; Collins, David John; and Griffin, David, 4,113,465, Cl. 71-92.000.
Staniland, Philip Anthony, 4,113,698, Cl. 528-481.000.

In Situ Technology, Inc.: *See—*
Terry, Ruel Carlton, 4,113,313, Cl. 299-4.000.

Inagaki, Syotaro: *See—*
Nakamura, Yoshihiro; Shibazaki, Kenji; Kono, Tateomi; Inagaki, Syotaro; and Murata, Tomoji, 4,113,374, Cl. 355-14.000.

Indesit Industria Elettrodomestici Italiana S.p.A.: *See—*
Campioni, Armando, 4,114,109, Cl. 330-267.000.

Industrie Pirelli Societa per Azioni: *See—*
Ferrentino, Antonio; and Brovedan, Antonio, 4,112,660, Cl. 57-59.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Fiorenza, Giorgio, 4,114,026, Cl. 235-375.000.

Ingersoll-Rand Company: *See—*
Larson, John Arden; and Fischer, Robert Bowlby, 4,113,527, Cl. 148-36.000.

Inoue, Haruo: *See—*
Sano, Takezo; Kobayashi, Akira; and Inoue, Haruo, 4,113,666, Cl. 521-29.000.

Inoue, Hiromitsu; Ohashi, Hiroshi; and Katayama, Susumu, to Matsushita Electric Works, Ltd. Ultrasonic wave watching device of moving object detecting type. 4,114,146, Cl. 340-558.000.

Inoue, Kashirou: *See—*
Tanaka, Shinzo; Tsubamoto, Shinichi; Yamashita, Koichi; Eguchi, Tadashi; and Inoue, Kashirou, 4,113,434, Cl. 23-232.00R.

Inoue, Masahide: *See—*
Ebihara, Masatomi; Inoue, Masahide; and Hidaka, Tsuneo, 4,113,500, Cl. 106-39.500.

Inoue, Shoji: *See—*
Lagow, Richard J.; and Inoue, Shoji, 4,113,772, Cl. 562-583.000.

Inoue, Yoshiaki: *See—*
Yoshikawa, Yoshio; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, 4,113,652, Cl. 252-428.000.

Institut de Recherches Chimiques et Biologiques Appliquees: *See—*
Debat, Jacques, 4,113,875, Cl. 424-278.000.

Institut Francais du Petrole: *See—*
Cheron, Jacques, 4,113,923, Cl. 429-36.000.
Cohen, Choua; and Sillion, Bernard, 4,113,637, Cl. 252-51.50A.

Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst: *See—*
Teodorescu, Constantin, 4,113,048, Cl. 181-220.000.

Instone, John C., to SGL Industries, Inc. Electrical outlet strip. 4,113,334, Cl. 339-22.00R.

Insurance Technology Company: *See—*
Ganske, Kingston; Hibbard, Earl R.; Falk, Mervin L.; and Denk, Joseph P., 4,114,183, Cl. 360-99.000.

Inter Control Hermann Kohler Elektrik GmbH & Co. KG: *See—*
Hollweck, Walter, 4,112,765, Cl. 73-368.300.

International Business Machines Corporation: *See—*
Ayers, Robert Lee; and Hamaker, Raymond Weaver, 4,113,512, Cl. 148-1.500.
Bassous, Ernest; and Liu, Cheng-Yih, 4,113,551, Cl. 156-662.000.
Boyd, William Weller; Grafe, Robert Joseph; and Pingry, Carl Oscar, III, 4,114,139, Cl. 340-147.00R.
Bush, Robert F.; and Mitchell, Joseph W., 4,113,521, Cl. 148-6.350.
Colglazier, Donald Francis; Fallon, John Leslie; Kollar, Ernest Paul; and Mares, Fred Ralph, 4,113,245, Cl. 271-10.000.
Karnaugh, Maurice, 4,114,143, Cl. 340-166.00R.
Pole, Robert Vladimir; and Werlich, Harald Willy, 4,113,343, Cl. 350-3.710.
Rollo, Anita Hand; and Stearns, David Burrell, 4,113,614, Cl. 210-22.00A.

International Harvester Company: *See—*
Coons, Robert R.; Hennessey, Richard G.; and Woffenden, John, 4,113,067, Cl. 188-71.600.
Deli, Jack M., 4,112,574, Cl. 29-527.100.
Picha, Donald A., 4,112,654, Cl. 56-98.000.

International Paper Company: *See—*
Nehring, John R., 4,112,947, Cl. 128-278.000.

International Standard Electric Corporation: *See—*
Jackson, Thomas M.; and Hodges, Robert J., 4,113,346, Cl. 350-96.200.

Inui, Tsuneo: *See—*
Tsutsui, Nobuyuki; Inui, Tsuneo; and Kawamura, Hiroaki, 4,113,580, Cl. 204-37.00T.

Ioffe, Benyamin Alexandrovich: *See—*
Ryzhov, Vladimir Dmitrievich; Litvinenko, Semen Kirillovich; Leikin, Roman Samuilovich; Kulberg, Anton Yanovich; Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich, 4,113,142, Cl. 221-171.000.

Iowa State University Research Foundation: *See—*
Larock, Richard C., 4,113,755, Cl. 260-429.00L.

Ireland, Graham A.: *See—*
MacLennan, P. H. Barry; Ireland, Graham A.; and Werba, William J., 4,112,756, Cl. 73-181.000.

Irma Ungerer Geb. Dollinger: *See—*
Rodach, Alexander, 4,113,198, Cl. 242-78.300.

Ishidoshiro, Hiroshi: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,112,713, Cl. 68-5.00E.

Ishiguro, Shoji: *See—*
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, 4,113,489, Cl. 96-60.00R.

Ishikawa, Kikuichi: *See—*
Oshio, Hiromichi; Konishi, Hiroyuki; Matsumura, Shiunzi; Ishikawa, Kikuichi; and Yoneyama, Eiichi, 4,113,463, Cl. 71-76.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, 4,113,416, Cl. 431-1.000.
Nakada, Tetsuro; Shimizu, Makoto; and Yoshinaga, Mayumi, 4,113,239, Cl. 266-137.000.
Yoshizawa, Isamu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,112,798, Cl. 83-344.000.

Ishimoto, Zenichi, to Nikko Co., Ltd. Remote control system for a movable toy vehicle. 4,112,615, Cl. 46-254.000.

Ishiwata, Samford P., to Texaco Inc. Liquid level measuring device. 4,112,760, Cl. 73-299.000.

Ishizawa, Hideo: *See—*
Matsunaga, Kazuo; Ishizawa, Hideo; and Kurata, Kenichi, 4,113,487, Cl. 96-38.100.

Isobe, Minoru, to Oki Electric Industry Co., Ltd. Pack for endless ink ribbon cartridge. 4,113,750, Cl. 206-388.000.

Isozaki, Hiroshi: *See—*
Yoshizawa, Isamu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,112,798, Cl. 83-344.000.

Itani, Takashi: *See—*
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, 4,113,369, Cl. 352-194.000.

Itaya, Yoshiro: *See—*
Shimizu, Junichi; Hara, Takashi; Iwakura, Tatsuya; and Itaya, Yoshiro, 4,113,892, Cl. 426-602.000.

Itek Corporation: *See—*
Wirtz, John Stanley, 4,113,378, Cl. 355-55.000.

Itoh, Hatuhide: *See—*
Kawabe, Takamasa; Kadoma, Masaaki; Murakami, Kazuyoshi; and Itoh, Hatuhide, 4,113,746, Cl. 260-348.220.

Itoh, Hiroyuki; Mitsuhashi, Kenhachi; and Akashi, Hiromitsu, to Yokohama Rubber Co., Ltd., The; and Fuji Telecasting Co., Ltd. Opto-electronic tensile testing system. 4,112,746, Cl. 73-95.000.

Itoh, Tadanao, to Ricoh Company, Ltd.; and Ricoh Educational Equipment Co., Ltd. Recording reproducer for magnetic cards. 4,114,181, Cl. 360-2.000.

Itoh, Tsutomu; Furuya, Nobuo; and Ohuchi, Kenji, to Onoda Cement Co., Ltd. Apparatus for forming a powder layer on the surface of a metallic squeeze-out tube. 4,112,869, Cl. 118-623.000.

Itoi, Kazuo: *See*—
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,113,968, Cl. 560-124.000.

ITT Industries, Inc.: *See*—
Bleckmann, Hans W., 4,113,321, Cl. 303-92.000.
Tippmann, Heinrich; and Huber, Wolfgang, 4,112,787, Cl. 74-798.000.

ITW-Ateco G.m.b.H.: *See*—
Schenk, Bernd, 4,113,300, Cl. 296-1.00C.

Iura, Yukio: *See*—
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Shimizu, Masami; Yoshikawa, Ryoichi; and Aizawa, Hiroshi, 4,114,173, Cl. 354-238.000.

Ivanov, Valentin Nikolaevich; and Chulkova, Anna Davydovna. Suspension for making molds in disposable pattern casting. 4,113,499, Cl. 106-38.350.

Iwakura, Tatsuya: *See*—
Shimizu, Junichi; Hara, Takashi; Iwakura, Tatsuya; and Itaya, Yoshiro, 4,113,892, Cl. 426-602.000.

Iwano, Haruhiko: *See*—
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, 4,113,489, Cl. 96-60.00R.

Iwase, Kozi: *See*—
Nakaoka, Kazuhide; Araki, Kenzi; Nishimoto, Akihiko; Iwase, Kozi; and Kubotera, Haruo, 4,113,517, Cl. 148-2.000.

Iwata, Toshiharu; Hattori, Tadashi; Mori, Kouichi; and Akiyama, Tomojiro, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Throttle valve control system for an internal combustion engine. 4,112,885, Cl. 123-98.000.

Iyeta, Motoi, to Nippon Gakki Seizo Kabushiki Kaisha. Tone pickup arm device keeping excellent dynamic lateral balance and damping effect. 4,113,265, Cl. 274-23.00R.

Izaki, Hiroshi: *See*—
Fukuta, Shigemi; Izaki, Hiroshi; and Yoshino, Shoichi, 4,113,002, Cl. 164-286.000.

Izawa, Junji: *See*—
Tokimoto, Tadashi; Kawaguchi, Kazumasa; Izawa, Junji; and Hiraishi, Yoshinobu, 4,113,844, Cl. 423-336.000.

Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, to Asahi-Dow Limited; and Sanko Kaihatsu Kagaku Kenkyusho. Flame-retardant polyphenylene ether resin composition. 4,113,795, Cl. 260-874.000.

Izon Corporation: *See*—
Yevick, George J., 4,113,348, Cl. 350-96.250.
Yevick, George J., 4,114,168, Cl. 354-102.000.

J. G. Sylvester Associates, Inc.: *See*—
Sylvester, Bruce J.; and Sylvester, Roger P., 4,112,775, Cl. 73-627.000.

J. I. Case Company: *See*—
Venable, Phillip G., 4,113,031, Cl. 172-667.000.

Jackson, Thomas M.; and Hodges, Robert J., to International Standard Electric Corporation. Method of making optical fiber terminations. 4,113,346, Cl. 350-96.200.

Jaeger, Dennis A. Machine gun rack. 4,113,107, Cl. 211-4.000.

Jaekel, Gunter R. Adjustable check valve. 4,112,959, Cl. 137-504.000.

Janome Sewing Machine Co., Ltd.: *See*—
Kakinuma, Toshihide; Kume, Toshiaki; Takenoya, Hideaki; Makabe, Hachiro; and Watanabe, Kazuo, 4,112,858, Cl. 112-158.00E.

Janvari, Erzsebet, nee Kanyo: *See*—
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, 4,113,868, Cl. 424-251.000.

Japan Atomic Energy Research Institute: *See*—
Hagiwara, Miyuki; Araki, Kunio; Matsuoka, Shingo; and Fujimura, Syunichi, 4,113,595, Cl. 204-159.170.

Japan Exlan Company Limited: *See*—
Fukushima, Keitaro; Kusunose, Takamaro; and Nosaka, Yoshinori, 4,113,847, Cl. 423-447.400.

Jeck, Arnulf: *See*—
Gettert, Hans; Jeck, Arnulf; and Werner, Dietmar, 4,113,445, Cl. 48-197.00R.

Jeffrey, Ian Campbell, to Dobson Park Industries Limited. Vehicle or carriage mounted materials transporting machine. 4,113,123, Cl. 214-141.000.

Jellinek, Karl: *See*—
Gardziella, Arno; and Jellinek, Karl, 4,113,898, Cl. 427-195.000.

Jenaer Glaswerk Schott & Gen.: *See*—
Kiefer, Werner, 4,113,904, Cl. 428-34.000.

Jennings Compound Bow, Inc.: *See*—
Caldwell, Joseph M., 4,112,909, Cl. 124-23.00R.

Jeretin, Stojan, to Dragerwerk Aktiengesellschaft. Device for controlling the respiration in respirators. 4,112,938, Cl. 128-142.00R.

Jeschke, Willi, to Heidelberger Druckmaschinen Aktiengesellschaft. Drive for sheet-fed rotary printing presses with at least two tandem-mounted printing units. 4,112,842, Cl. 101-183.000.

Johansson, Hans A. Shower-bath tub. 4,112,524, Cl. 4-148.000.

Johansson, Ingvar, to Svenska Traforskningsinstitutet. Method of joining wood products. 4,113,542, Cl. 156-335.000.

John, Peter: *See*—
Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, 4,113,760, Cl. 260-448.20E.

John Zink Company: *See*—
Cantrell, Clifford J., Jr., 4,113,005, Cl. 165-40.000.

Johnson, David R., to Dow Chemical Company, The. Method to produce multivalent metals from fused bath and metal electrowinning feed cathode apparatus. 4,113,584, Cl. 204-64.00R.

Johnson, David W.; and Johnson, Gary C. Rotating magnus tubes. 4,113,299, Cl. 296-1.00S.

Johnson, Gary C.: *See*—
Johnson, David W.; and Johnson, Gary C., 4,113,299, Cl. 296-1.00S.

Johnson & Johnson: *See*—
Turner, Robert B., 4,112,764, Cl. 73-362.0AR.
Turner, Robert B., 4,114,053, Cl. 307-310.000.
Turner, Robert Bruce; Menzin, Marvin; Robinson, Hugh A.; and Williams, Thomas S., 4,112,762, Cl. 73-343.00R.

Johnson, Michael R.: *See*—
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,113,723, Cl. 260-347.300.

Johnson, Peter E.; and Rowland, Bob G., to Evans Products Company. Battery separator having coated ribs. 4,113,927, Cl. 429-143.000.

Johnson, Richard A., to Halcon International, Inc. Conversion of mono-valent thallium to tri-valent thallium. 4,113,756, Cl. 260-429.00R.

Jones, Alan Philip, to Saunders Valve Company Limited. Fluid flow control valves. 4,113,826, Cl. 264-269.000.

Jones, Geraint; and Thomson, David Summers, to Imperial Chemical Industries Limited. Pharmaceutical compositions and method of use. 4,113,879, Cl. 424-304.000.

Jones, John Leslie, to California Institute Research Foundation. Smokeless slow burning cast propellant. 4,112,849, Cl. 102-103.000.

Jones, Lawrence T.: *See*—
Sims, Anson; and Jones, Lawrence T., 4,113,261, Cl. 273-249.000.

Jones, Robert D., to United States of America, Energy. Apparatus for controlling coolant level in a liquid-metal-cooled nuclear reactor. 4,113,562, Cl. 176-40.000.

Jones, Thornton K.: *See*—
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,113,525, Cl. 148-23.000.
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., 4,113,526, Cl. 148-23.000.

Jones, Trevor E.: *See*—
Collins, John D.; and Jones, Trevor E., 4,113,758, Cl. 260-429.700.

Jordan, Edgar R. Reinforced aperture in molded plastic article. 4,113,398, Cl. 403-267.000.

Joseph, Adrian: *See*—
Severdia, Anton; and Joseph, Adrian, 4,112,832, Cl. 99-421.0HH.

Jos. Dyson & Sons, Inc.: *See*—
Foss, Richard W., 4,113,128, Cl. 214-750.000.

Joseph, Raymond, to Ateliers Reunis Societe Anonyme. Wire-netting baskets, basket heightening devices and the like. 4,113,131, Cl. 220-19.000.

Joseph, Robert. Jewelry article with radiometer therein. 4,112,707, Cl. 63-31.000.

Joyce, Patrick J.: *See*—
Leveen, Harry H.; and Joyce, Patrick J., 4,113,851, Cl. 424-28.000.

Jozwiak, Edward L., Jr.; and Das, Suryya K., to PPG Industries, Inc. Method for electrodeposition. 4,113,598, Cl. 204-181.00R.

Juichi, Imamura; Masahiko, Takehara; and Kazuhiro, Kizawa, to Agency of Industrial Science and Technology. Process for the preparation of formylated phenoxy compounds. 4,113,782, Cl. 260-600.00R.

Julius Blum Gesellschaft M.B.H.: *See*—
Rock, Erich; and Mages, Bernhard, 4,112,543, Cl. 16-164.000.

Jurovsky, Abram Zinovievich: *See*—
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, 4,113,833, Cl. 423-131.000.

Jutte, Hans; and Weber, Helmut. Drive shield. 4,112,696, Cl. 405-145.000.

Juusela, Jyrki Tapani: *See*—
Aaltonen, Olavi August; and Juusela, Jyrki Tapani, 4,113,470, Cl. 75-74.000.

Kabs, Klaus: *See*—
Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, 4,113,762, Cl. 260-463.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Kaneko, Noboru, 4,112,669, Cl. 58-4.00A.

Kabushiki Kaisha Saginomiya Seisakusho: *See*—
Kaneko, Moriwo, 4,112,704, Cl. 62-217.000.

Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,113,544, Cl. 156-384.000.

Kabushiki Kaisha Seikosha: *See*—
Fujita, Masanori; and Suzuki, Sukenori, 4,113,981, Cl. 174-88.00R.

Kabushiki Kaisha Suwa Seikosha: *See*—
Minowa, Masahiro, 4,113,391, Cl. 400-120.000.
Morozumi, Shinji, 4,112,670, Cl. 58-23.00A.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Suzuki, Yoshihisa; Sugiura, Katuaki; Suzuki, Osamu; and Tashiro, Ichiro, 4,112,661, Cl. 57-34.00R.

Kabushiki Kaisha Yachiyo Kogyo Kenkyusho: *See*—
Yoshio, Hashimoto, 4,113,115, Cl. 214-1.0BB.

Kadoma, Masaaki: *See*—
Kawabe, Takamasa; Kadoma, Masaaki; Murakami, Kazuyoshi; and Itoh, Hatuhide, 4,113,746, Cl. 260-348.220.

Kadowaki, Shunichi: *See*—
Asano, Masaharu; and Kadowaki, Shunichi, 4,112,880, Cl. 123-32.0EE.
Kaeding, Warren W.; and Young, Lewis Brewster, to Mobil Oil Corporation. Selective production of para-xylene. 4,113,788, Cl. 260-673.000.
Kaes, Richard W. Fish manure removal method. 4,113,616, Cl. 210-67.000.
Kageyama, Minoru: *See*—
Hayashi, Torahiko; Kageyama, Minoru; and Morikawa, Michio, 4,113,819, Cl. 264-173.000.
Kagiyama, Yasuo; and Miyazaki, Nobumasa, to Daihatsu Diesel Manufacturing Co., Ltd. Temperature controlled valve assembly. 4,113,174, Cl. 236-12.00A.
Kai, Fumio; Saito, Toshinori; Seki, Shigeo; and Kawasaki, Toyoaki, to Meiji Seika Kaisha, Ltd. Cephalosporin-type antibiotics and process for producing the same. 4,113,944, Cl. 544-27.000.
Kaimori, Kenichiro: *See*—
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, 4,113,264, Cl. 274-15.00R.
Kaiser Aluminum & Chemical Corporation: *See*—
Bell, Norman; Andersen, John N.; and Lam, Hung-Kei H., 4,113,832, Cl. 423-119.000.
Dorsey, Geoffrey A., Jr., 4,113,520, Cl. 148-6.270.
Kaiser, George E.: *See*—
Williams, Douglas W.; and Kaiser, George E., 4,113,044, Cl. 180-51.000.
Kaiser Steel Corporation: *See*—
Collin, Alvaro L.; and Patel, Gordhan M., 4,112,693, Cl. 405-132.000.
Kajima Kensetsu Kabushiki Kaisha: *See*—
Hosoya, Kazuo; and Kubota, Munetaka, 4,112,690, Cl. 405-57.000.
Kajiura, Masaru: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, 4,113,441, Cl. 422-197.000.
Kakinuma, Toshihide; Kume, Toshiaki; Takenoya, Hideaki; Makabe, Hachiro; and Watanabe, Kazuo, to Janome Sewing Machine Co., Ltd. Sewing machine with a pattern generating device. 4,112,858, Cl. 112-158.00E.
Kakizaki, Yukio, to Nippon Kogaku K. K. Cross-movable carriage. 4,113,223, Cl. 248-430.000.
Kalchgruber, Gerhard: *See*—
Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, 4,113,760, Cl. 260-448.20E.
Kalnin, Ilmar L.; and Breckenridge, George J., to Celanese Corporation. Production of high temperature resistant polymer compositions capable of forming superior fiber reinforced composite articles. 4,113,683, Cl. 260-857.0TW.
Kalnin, Robert Karlovich: *See*—
Ryzhov, Vladimir Dmitrievich; Litvinenko, Semen Kirillovich; Leikin, Roman Samuilovich; Kulberg, Anton Yanovich; Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich, 4,113,142, Cl. 221-171.000.
Kaluzhsky, Nikolai Andreevich: *See*—
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, 4,113,833, Cl. 423-131.000.
Kamano, Yoshiaki; Michishita, Kazuhiko; Seki, Teruya; and Tanaka, Ichiro, to Taisho Pharmaceutical Co., Ltd. Method for preparing 17 α-ester-21-halo pregnanes. 4,113,680, Cl. 260-397.450.
Kamata, Akira: *See*—
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, 4,113,568, Cl. 195-68.000.
Kamimura, Yoshiharu: *See*—
Sakurai, Toshio; Shimada, Shoji; and Kamimura, Yoshiharu, 4,113,635, Cl. 252-49.600.
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, to Fujisawa Pharmaceutical Co., Ltd. 7-Amino 2-lower alkyl-2 or 3-cephem-4-carboxylic acid derivatives and processes for preparation thereof. 4,113,940, Cl. 544-16.000.
Kanbe, Masaru: *See*—
Kogure, Motoo; Komiya, Mamoru; Oishi, Masaharu; and Kanbe, Masaru, 4,113,918, Cl. 428-412.000.
Kandanian, Aram Y.: *See*—
Cotten, Roger C.; Young, David W.; and Kandanian, Aram Y., 4,113,804, Cl. 260-897.00A.
Kandler, Joachim: *See*—
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; Auel, Theodor; and Kloss, Werner, 4,113,841, Cl. 423-265.000.
Kaneko, Moriwo, to Kabushiki Kaisha Saginomiya Seisakusho. Pilot valve-type evaporating pressure-regulating valve used in refrigerators. 4,112,704, Cl. 62-217.000.
Kaneko, Noboru, to Kabushiki Kaisha Daini Seikosha. Digital electronic timepiece. 4,112,669, Cl. 58-4.00A.
Kaneko, Yasunori: *See*—
Maki, Masao; Kaneko, Yasunori; Tsuruda, Kunihiro; and Kobayashi, Ikuo, 4,113,839, Cl. 423-239.000.
Kaneko, Yutaka: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, 4,113,490, Cl. 96-60.00R.
Kang, Pierson S., to ChemPar Corporation. Method of making cutting, scoring and embossing die set. 4,112,827, Cl. 93-58.300.
Kankaanpaa, Matti, to Valmet Oy. Paper machine with twin-wire former. 4,113,556, Cl. 162-272.000.
Kankaanpaa, Matti, to Valmet Oy. Paper manufacturing structure particularly for detaching a web from a wire. 4,113,557, Cl. 162-301.000.
Kano, Masafumi: *See*—
Tugukuni, Hideyoshi; and Kano, Masafumi, 4,113,917, Cl. 428-407.000.
Kantner, Edward, to Exxon Research & Engineering Co. Zinc-halogen compound electrochemical cell having an auxiliary electrode and method. 4,113,924, Cl. 429-50.000.
Kanzaki, Hisao: *See*—
Nojiri, Shoji; Kanzaki, Hisao; Yasoshima, Nobuyuki; Satake, Yasuo; and Ogawa, Kenichi, 4,113,990, Cl. 179-84.00R.
Kapanka, Harley L., to General Motors Corporation. Headrest for vehicles. 4,113,310, Cl. 297-408.000.
Kaplan, Jay: *See*—
Schulman, Jerome L.; and Kaplan, Jay, 4,112,926, Cl. 128-2.00S.
Karlin, James Hilliard: *See*—
Derdzinski, Terrence Edmund; and Karlin, James Hilliard, 4,113,331, Cl. 312-198.000.
Karliner, Rudolf R.: *See*—
Brown, Robert M.; and Karliner, Rudolf R., 4,113,151, Cl. 222-324.000.
Karnaugh, Maurice, to International Business Machines Corporation. Modular switching system. 4,114,143, Cl. 340-166.00R.
Kasai, Kazumi, to Yoshida Kogyo K.K. Separable slide fastener with an automatically locking slider. 4,112,554, Cl. 24-205.11R.
Kasmarik, Joseph R., to Avco Corporation. Thrust spoiler for turbofan engine. 4,112,677, Cl. 60-226.00R.
Kasparek, Karel: *See*—
Chrtek, Milan; Gabler, Josef; Tuma, Frantisek; Kasparek, Karel; and Blasko, Jan, 4,112,663, Cl. 57-58.890.
Katano, Takeshi: *See*—
Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, 4,114,097, Cl. 325-320.000.
Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Rotary burner. 4,113,416, Cl. 431-1.000.
Katayama, Susumu: *See*—
Inoue, Hiromitsu; Ohashi, Hiroshi; and Katayama, Susumu, 4,114,146, Cl. 340-558.000.
Kato, Hisao; and Sakamoto, Yohei. Apparatus for collecting shellfish and the like. 4,112,602, Cl. 37-55.000.
Kato, Yoshiaki; and Motoki, Jinro, to Citizen Watch Co., Ltd. Pulse motor driving system for use in a timepiece. 4,112,671, Cl. 58-23.00D.
Katz, George, to RCA Corporation. Method of assembling components on printed circuit boards. 4,113,524, Cl. 148-23.000.
Katz, Lewis Emanuel; and Paulnack, Carl Lewis, to Bell Telephone Laboratories, Incorporated. Formation of epitaxial layers on substrate wafers utilizing an inert heat radiation ring to promote uniform heating. 4,113,547, Cl. 156-612.000.
Katz, Saul Norman, to General Foods Corporation. Membrane decaffeination. 4,113,886, Cl. 426-422.000.
Kauffman, Robert N.: *See*—
Smith, James D. B.; and Kauffman, Robert N., 4,113,791, Cl. 260-830.0TW.
Kauffman, William J., to Armstrong Cork Company. Novel catalyst system for trimerization of organic isocyanates. 4,113,945, Cl. 544-67.000.
Kaufman, Aleksander Arkadi, to Scintrex Limited. Inductive source method of induced polarization prospecting. 4,114,086, Cl. 324-1.000.
Kaufmann, Helmut: *See*—
Helfgen, Werner; Lindner, Gerhard; Lingens, Paul; and Kaufmann, Helmut, 4,113,811, Cl. 264-3.00R.
Kaveloski, Robert J. Prefabricated disposable fly trap blank. 4,112,609, Cl. 43-118.000.
Kawabe, Takamasa; Kadoma, Masaaki; Murakami, Kazuyoshi; and Itoh, Hatuhide, to Osaka Soda Co., Ltd. Process for continuous production of epichlorohydrin. 4,113,746, Cl. 260-348.220.
Kawada, Hiroitsu: *See*—
Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, 4,113,882, Cl. 424-317.000.
Kawaguchi, Kazumasa: *See*—
Tokimoto, Tadashi; Kawaguchi, Kazumasa; Izawa, Junji; and Hiraishi, Yoshinobu, 4,113,844, Cl. 423-336.000.
Kawahara, Shigemi: *See*—
Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, 4,113,882, Cl. 424-317.000.
Kawakami, Isao: *See*—
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, 4,113,568, Cl. 195-68.000.
Kawamura, Hiroaki: *See*—
Tsutsui, Nobuyuki; Inui, Tsuneo; and Kawamura, Hiroaki, 4,113,580, Cl. 204-37.00T.

Kawamura, Yuzo. Method for manufacturing composition including fine particles dispersed therein. 4,113,815, Cl. 264-101.000.

Kawasaki Kasei Chemicals Ltd.: *See*—
Matsuura, Ryo; Nakatani, Shuichi; Nagaoka, Kazuya; and Hioki, Katsuhiko, 4,113,749, Cl. 260-351.000.

Kawasaki, Kazuhiko: *See*—
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, 4,113,264, Cl. 274-15.00R.

Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Weak camera battery warning circuit. 4,114,176, Cl. 354-289.000.

Kawasaki, Mikio: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, 4,113,490, Cl. 96-60.00R.

Kawasaki Steel Corporation: *See*—
Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, 4,113,530, Cl. 148-113.000.

Kawasaki, Toyoaki: *See*—
Kai, Fumio; Saito, Toshinori; Seki, Shigeo; and Kawasaki, Toyoaki, 4,113,944, Cl. 544-27.000.

Kay, Peter Dunlop, to Tioxide Group Limited. Titanium compounds. 4,113,757, Cl. 260-429.500.

Kaya, Hisao: *See*—
Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, 4,113,416, Cl. 431-1.000.

Kayabakogyokabushikikaisha: *See*—
Murata, Hikaru, 4,112,822, Cl. 91-29.000.
Murata, Hikaru, 4,112,825, Cl. 91-447.000.

Kayanuma, Kanji, to Victor Company of Japan, Limited. Closed loop laser noise elimination for optoelectronic recording. 4,114,180, Cl. 358-128.000.

Kaye, Morton. Opto-mechanical measuring system. 4,112,579, Cl. 33-174.00L.

Kaye, Morton. Optical measurement system. 4,113,389, Cl. 356-164.000.

Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, to Agency of Industrial Science and Technology. Apparatus for separating non-magnetic materials of different densities. 4,113,608, Cl. 209-1.000.

Kazuhiro, Kizawa: *See*—
Juichi, Imamura; Masahiko, Takehara; and Kazuhiro, Kizawa, 4,113,782, Cl. 260-600.00R.

Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, to Boehringer Ingelheim GmbH. 2- or 4-Hydroxy-3,5-dihalo-benzylamines and salts thereof. 4,113,777, Cl. 260-570.900.

Keeney, Joseph G.: *See*—
Wild, Robert W.; and Keeney, Joseph G., 4,112,535, Cl. 15-98.000.

Keiner, Hildegard; Schmid, Emil; and Richly, Walter, to Licentia Patent-Verwaltungs-G.m.b.H. Method of manufacturing an electrically conductive contact layer. 4,113,896, Cl. 427-108.000.

Keiper K. G.: *See*—
Werner, Paul; Wirtz, Egon; and Lehmann, Gerhard, 4,113,308, Cl. 297-362.000.

Keiper Trainingsysteme GmbH & Co.: *See*—
Putsch, Peter Ulrich, 4,112,928, Cl. 128-2.05R.

Kemper, Yves Jean; and Bigot, Lucien, to Vadetec Corporation. Variable speed transmission device. 4,112,779, Cl. 74-191.000.

Kemper, Yves Jean; and Bigot, Lucien, to Vadetec Corporation. Variable speed transmission device. 4,112,780, Cl. 74-191.000.

Kendall, John Edward; and Butwell, Kenneth Francis, to Union Carbide Corporation. Process for separating polymeric contaminants from aqueous absorbent solutions used to treat organic gas-containing gas streams. 4,113,837, Cl. 423-226.000.

Kendall, Larry J., to Fairchild Camera and Instrument Corporation. Current comparator for an improved analog-to-digital converter method and apparatus. 4,114,149, Cl. 340-347.0AD.

Kenji, Usui: *See*—
Shogo, Iizuka; Mitsuo, Endo; Mitsugu, Watanabe; Toshio, Iizuka; and Kenji, Usui, 4,114,014, Cl. 219-56.000.

Kenkare, Divaker B.; and Shumway, Durland K., to Colgate-Palmolive Company. Antiperspirant composition. 4,113,852, Cl. 424-46.000.

Kenkare, Divaker B.: *See*—
Carson, John C., Jr.; Robbins, Clarence R.; and Kenkare, Divaker B., 4,112,536, Cl. 15-104.940.

Kennecott Copper Corporation: *See*—
Cook, Glenn; and Larson, Paul, 4,113,586, Cl. 204-105.00R.
Smith, Richard D., 4,113,475, Cl. 75-159.000.

Kennedy, Harold, Jr., to United States Pipe and Foundry Company. Hanger for pipe. 4,113,286, Cl. 285-61.000.

Kennedy, John Hamilton: *See*—
Duff, Ian David; Kennedy, John Hamilton; and Bunce, Roger Abraham, 4,113,437, Cl. 422-63.000.

KeNova AB: *See*—
Nilson, Billy N., 4,112,971, Cl. 137-508.000.

Kent, Harry James: *See*—
Pietrusza, Arthur Jacob; and Kent, Harry James, 4,113,413, Cl. 435-222.000.

Kerfoot, William B.; and Brainard, Edward C., II, to Environmental Devices Corporation. Scanning apparatus for septic effluents. 4,112,741, Cl. 73-53.000.

Kernell, Samuel H. Twirling toy device. 4,112,611, Cl. 46-47.000.

Kessler, Gerald. D.I.G. Foam spacer. 4,113,905, Cl. 428-34.000.

Ketterer, Richard J. Device for cleaning and revitalizing wound strings for musical instruments. 4,112,808, Cl. 84-453.000.

Keuffel & Esser Company: *See*—
Kooi, J. Peter E.; and Vagyoczky, Stephen, 4,112,584, Cl. 33-292.000.

Khare, Gyaneshwar Prasad. Radioimmunoassay of hormones and metabolites in blood serum and plasma. 4,113,433, Cl. 23-230.600.

Kibler, Roland G., to General Motors Corporation. Engine speed governor. 4,112,886, Cl. 123-103.00R.

Kidde Consumer Durables Corp.: *See*—
Belinkoff, Irving R., 4,113,188, Cl. 241-37.500.

Kiefer, Udo; von Loeben, Wolf; and Schulz, Friedrich Wilhelm, to Siemens Aktiengesellschaft. Apparatus for measuring caster and camber in motor vehicles. 4,113,393, Cl. 356-155.000.

Kiefer, Werner, to Jenaer Glaswerk Schott & Gen. Fire resistant windows. 4,113,904, Cl. 428-34.000.

Kierstead, Richard Wightman: *See*—
Cohen, Michael Robert; Kierstead, Richard Wightman; and Tilley, Jefferson Wright, 4,113,776, Cl. 260-565.000.

Kiess, Ulrich: *See*—
Kohler, Werner; Drucker, Gerhard; Kiess, Ulrich; and Stotz, Manfred, 4,113,925, Cl. 429-78.000.

Kikuchi, Shoji: *See*—
Deguchi, Hidetaka; Kikuchi, Shoji; Wada, Hajime; Satoh, Shui; and Endo, Takaya, 4,113,491, Cl. 96-66.00R.

Kikuchi, Tatsuo: *See*—
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Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,113,582, Cl. 204-39.000.

Kimball International, Inc.: *See*—
Robinson, John William; Crosby, Thomas C.; and Howell, Stephen Louis, 4,112,802, Cl. 84-1.010.

Kimura, Akio: *See*—
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, 4,113,864, Cl. 424-225.000.

Kimura, Katsuhiko; and Nishikawa, Masaji, to Olympus Optical Co., Ltd. Photosensitive screen drum for electrographic apparatuses. 4,113,372, Cl. 355-3.0SC.

Kimura, Shin: *See*—
Terasawa, Yoshio; and Kimura, Shin, 4,114,178, Cl. 357-38.000.

King, Charles A.; and Gutterman, Robert P., to General Kinetics, Incorporated. Magnetic can sorter. 4,113,609, Cl. 209-609.000.

King, John Olmsted. Self-dimpling fastener pin. 4,112,811, Cl. 85-7.000.

King, William Clifton, to Bell Telephone Laboratories, Incorporated. Optically coupled device with diffusely reflecting enclosure. 4,114,177, Cl. 357-19.000.

Kirchmayr, Rudolf: *See*—
Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, 4,113,669, Cl. 521-108.000.

Kirsch, Bernhard. Ski binding automatically releasable by overstress. 4,113,276, Cl. 280-616.000.

Kirsch, Norbert, to General Motors Corporation. Bumpers on motor vehicles. 4,113,296, Cl. 293-96.000.

Kirschner, Helmut: *See*—
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Kitamura, Masanao: *See*—
Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, 4,113,416, Cl. 431-1.000.

Kitrell, John V. Safety reflector device for bicycles or the like. 4,113,351, Cl. 350-99.000.

Kitzig, Werner: *See*—
Kocher, Heinz; Kitzig, Werner; and Witteveen, Piet Jozef, 4,113,203, Cl. 244-3.110.

Kiuchi, Mitsuyuki; Amagami, Keizo; Maeda, Shigeru; and Saegusa, Shigeharu, to Matsushita Electric Industrial Co., Ltd.; and Kyokuto Electric Company, Limited. Switching and heat control mechanism for induction heating cooking apparatus having a plurality of work coils. 4,114,009, Cl. 219-10.49R.

Kiuru, Erkki Sakari: *See*—
Leinonen, Erkki Ilmari; and Kiuru, Erkki Sakari, 4,114,085, Cl. 323-17.000.

Klaasen, Dirk, to Stamicarbon, B.V. Apparatus for producing polymers having a wide molecular weight distribution. 4,113,440, Cl. 422-132.000.

Klank, Otto, to Licentia Patent-Verwaltungs-G.m.b.H. Rapid tuning circuit for high frequency receivers. 4,114,100, Cl. 325-453.000.

Kleiman, Moisha Gershovich: *See*—
Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich, 4,112,702, Cl. 62-123.000.

Klein, Donald J.: *See*—
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Klein, Gerhart P., to P. R. Mallory & Co. Inc. Continuous open-ended sintering furnace system. 4,113,240, Cl. 266-252.000.

Klein, Yitzhak: *See*—
Goldstein, Jonathan R.; and Klein, Yitzhak, 4,113,921, Cl. 429-27.000.

Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, to Deutsche Gold- und Silber-

Scheideanstalt Vormals Roessler. Process for the production of benzoyl cyanide (I). 4,113,773, Cl. 260-545.00R.

Kley, Victor B. Potentiometer. 4,114,134, Cl. 338-231.000.

Klie, Jurgen, to G. Duesterloh GmbH. Control arrangement for a hydrostatic axial or radial piston machine. 4,112,973, Cl. 137-625.210.

Klinger AG: *See*—
Kruschik, Julius, 4,112,965, Cl. 137-219.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Hoppen, Heinz; and Fasbender, Heinz, 4,113,187, Cl. 241-24.000.
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Knapp, Heinrich: *See*—
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Knepler, John T., to Dickey-john Corporation. Air pressure monitor. 4,112,777, Cl. 73-728.000.

Kobayashi, Akira: *See*—
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Kobayashi, Hidehiko: *See*—
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Kobayashi, Ikuo: *See*—
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Kobayashi, Shigeru: *See*—
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Kobe Steel, Ltd.: *See*—
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Kober, Alfred E.: *See*—
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Kobosh, Harry J. Portable seat for hunters. 4,113,058, Cl. 182-187.000.

Koch, Hans W., to Roller Bearing Company of America. Combination seal and thrust washer for anti-friction bearings. 4,113,327, Cl. 308-187.100.

Koch, Karlheinz; and Breitzke, Willi, to Henkel Kommanditgesellschaft auf Aktien. High viscosity neutral polyester lubricants. 4,113,642, Cl. 252-56.00S.

Koch, Robert L., II, to George Koch Sons, Inc. Radiation curable coating process. 4,113,894, Cl. 427-44.000.

Kocher, Heinz; Kitzig, Werner; and Witteveen, Piet Jozef, to Bolkow Gesellschaft mit beschrankter Haftung. Method and apparatus for thrust vector control of spin stabilized flying bodies by means of a single jet rudder. 4,113,203, Cl. 244-3.110.

Koether, Bernard G.; and Shaughnessy, William J., to Food Automation-Service Techniques, Inc. Filter apparatus. 4,113,623, Cl. 210-167.000.

Kogure, Motoo; Komiya, Mamoru; Oishi, Masaharu; and Kanbe, Masaru, to Konishiroku Photo Industry Co., Ltd. Undercoat-applied plastic films. 4,113,918, Cl. 428-412.000.

Kohler, Werner; Drucker, Gerhard; Kiess, Ulrich; and Stotz, Manfred, to Daimler-Benz Aktiengesellschaft. Battery filling and venting structure. 4,113,925, Cl. 429-78.000.

Kohlhepp, Dean H.: *See*—
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Kohlstette, Werner: *See*—
Pautsch, Gunthard; and Kohlstette, Werner, 4,113,172, Cl. 233-11.000.

Koike, Hiroshi; Suzuki, Shoji; and Asakawa, Takeki. Automatic diaphragm assembly. 4,113,359, Cl. 350-269.000.

Koike, Sakae; Matsunami, Shoichi; Goto, Yorinobu; and Tanabe, Yoshio, to Mitsubishi Chemical Industries, Ltd. Method of treating combustion exhaust gas containing nitrogen oxides. 4,113,838, Cl. 423-235.000.

Kojima, Katsuhiro: *See*—
Watanabe, Kazuo; Endo, Toshio; and Kojima, Katsuhiro, 4,112,626, Cl. 51-35.000.

Kojimoto, Susumu; Sato, Takami; and Mori, Toshio, to Sumitomo Chemical Company, Limited. Method for producing special pipes having longitudinally extending diaphragm partitions. 4,113,814, Cl. 264-89.000.

Koketsu, Sotoichi. Spectacles' frame with vertically adjustable nose pads. 4,113,365, Cl. 351-128.000.

Kolb, Dieter: *See*—
Ford, Michael Alan; Mould, Henry Manifold; and Kolb, Dieter, 4,113,385, Cl. 356-96.000.

Kolb, Gunter: *See*—
Sackmann, Gunter; Hendricks, Udo-Winfried; Honig, Hans-Ludwig; Kolb, Gunter; and Muller, Friedhelm, 4,113,506, Cl. 106-238.000.

Kolk, Erich: *See*—
Schweier, Gunther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, 4,113,933, Cl. 526-124.000.

Kollar, Ernest Paul: *See*—
Colglazier, Donald Francis; Fallon, John Leslie; Kollar, Ernest Paul; and Mares, Fred Ralph, 4,113,245, Cl. 271-10.000.

Koller, Stefan: *See*—
Loew, Peter; and Koller, Stefan, 4,113,718, Cl. 260-147.000.

Kolling, Georg: *See*—
Kroger, Carl; Romey, Ingo; and Kolling, Georg, 4,113,817, Cl. 264-120.000.

Kolyshenko, Mikhail Vasilievich: *See*—
Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich, 4,113,019, Cl. 169-12.000.

Komatsu Electronci Metals, Co., Ltd.: *See*—
Tokimoto, Tadashi; Kawaguchi, Kazumasa; Izawa, Junji; and Hiraishi, Yoshinobu, 4,113,844, Cl. 423-336.000.

Komatsu, Saburo, to O.P.O. Giken Kabushiki Kaisha. Plunger type solenoid. 4,114,125, Cl. 335-258.000.

Komatsu, Toshio: *See*—
Yoshikawa, Yoshio; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, 4,113,652, Cl. 252-428.000.

Komiya, Mamoru: *See*—
Kogure, Motoo; Komiya, Mamoru; Oishi, Masaharu; and Kanbe, Masaru, 4,113,918, Cl. 428-412.000.

Komiyama, Yoshiro; Kondo, Katsumi; Koyama, Mototsugu; Nagaoka, Masaaki; and Uchida, Tsuneo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust system means for automobiles. 4,113,167, Cl. 228-176.000.

Kondo, Katsumi: *See*—
Komiyama, Yoshiro; Kondo, Katsumi; Koyama, Mototsugu; Nagaoka, Masaaki; and Uchida, Tsuneo, 4,113,167, Cl. 228-176.000.

Kondo, Yoshikazu: *See*—
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; and Suzuki, Shosuke, 4,113,053, Cl. 181-284.000.

Konig, Horst: *See*—
Gudenau, H. W.; Konig, Horst; Rath, Gero; and Roth, Haye, 4,113,468, Cl. 75-12.000.

Konishi, Hiroyuki: *See*—
Oshio, Hiromichi; Konishi, Hiroyuki; Matsumura, Shiunzi; Ishikawa, Kikuichi; and Yoneyama, Eiichi, 4,113,463, Cl. 71-76.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Deguchi, Hidetaka; Kikuchi, Shoji; Wada, Hajime; Satoh, Shui; and Endo, Takaya, 4,113,491, Cl. 96-66.00R.
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, 4,113,490, Cl. 96-60.00R.
Kogure, Motoo; Komiya, Mamoru; Oishi, Masaharu; and Kanbe, Masaru, 4,113,918, Cl. 428-412.000.

Kono, Tateomi: *See*—
Nakamura, Yoshihiro; Shibazaki, Kenji; Kono, Tateomi; Inagaki, Syotaro; and Murata, Tomoji, 4,113,374, Cl. 355-14.000.

Kontekla Oy.: *See*—
Ebeling, Martti Olavi Aladar; and Lunden, Risto Waldemar, 4,112,691, Cl. 405-119.000.

Kooi, Else; and vanLierop, Joseph Gijsbertus, to U.S. Philips Corporation. Semiconductor manufacturing method using buried nitride formed by a nitridation treatment in the presence of active nitrogen. 4,113,515, Cl. 148-1.500.

Kooi, J. Peter E.; and Vagyoczky, Stephen, to Keuffel & Esser Company. Telescope level adjusting means. 4,112,584, Cl. 33-292.000.

Kopp, Valentine T., to Merrill Brothers. Lifting clamp and spring therefor. 4,113,298, Cl. 294-104.000.

Koppehele, Frithjof: *See*—
Bauch, Helmut; Mohrmann, Karl Heinz; and Koppehele, Frithjof, 4,114,107, Cl. 330-56.000.

Koppl, Franz: *See*—
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, 4,113,532, Cl. 148-174.000.

Koranda, Clarence J. Railway hopper car labyrinth gate seal. 4,112,852, Cl. 105-282.00A.

Korbuly, Jozsef: *See*—
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, 4,113,287, Cl. 285-137.00R.

Kores S.p.A.: *See*—
Muthenthaller, Gustav, 4,113,164, Cl. 227-124.000.

Kornis, Gabriel: *See*—
Moon, Malcolm W.; and Kornis, Gabriel, 4,113,955, Cl. 548-374.000.
Moon, Malcolm W.; and Kornis, Gabriel, 4,113,956, Cl. 548-374.000.

Korosue, Akira. Variable speed power transmission. 4,112,778, Cl. 74-117.000.

Koseki, Yasuo; Takahashi, Sankichi; and Nakaoka, Azuma, to Hitachi, Ltd. Method of and apparatus for solid-liquid separation. 4,113,618, Cl. 210-82.000.

Koslowski, Gerhard: *See*—
Schippers, Heinz; Hensen, Friedhelm; Koslowski, Gerhard; and Czerwon, Dieter, 4,113,935, Cl. 526-351.000.

Kosolapova, Antonina Pavlovna: *See*—
Mirsky, Yakov Volfovich; Dorogochinsky, Akivy Zinovievich; Meged, Nelli Fillipovna; and Kosolapova, Antonina Pavlovna, 4,113,843, Cl. 423-329.000.

Kostin, Vladimir Nikolaevich: *See*—
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, 4,113,833, Cl. 423-131.000.

Kotelnikov, Grigory Vladimirovich: *See*—
Goryachev, Vladimir Ilich; Kotelnikov, Grigory Vladimirovich; and Makurin, Pavel Semenovich, 4,112,734, Cl. 73-15.00B.

Kountz, Kenneth John, to Borg-Warner Corporation. Refrigeration control system. 4,112,703, Cl. 62-211.000.

Koutroulos, Jean: *See*—
Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Koutroulos, Jean, 4,113,483, Cl. 96-1.0PC.

Kowitz, Friedrich: *See*—
Bischoff, Jurgen; Kowitz, Friedrich; Ott, Karl-Heinz; Schuster, Herbert; Rohr, Harry; and Weitzel, Hans, 4,113,796, Cl. 260-876.00R.

Koyama, Mitsuo: *See*—
Onda, Eiichi; Watanabe, Masanori; Nakagawa, Tadashi; Nemoto, Ichiro; and Koyama, Mitsuo, 4,114,174, Cl. 354-249.000.

Koyama, Mototsugu: *See*—
Komiyama, Yoshiro; Kondo, Katsumi; Koyama, Mototsugu; Nagaoka, Masaaki; and Uchida, Tsuneo, 4,113,167, Cl. 228-176.000.

Koyo Seiko Company Limited: *See*—
Okuda, Hiroji; and Harada, Shigenori, 4,112,710, Cl. 64-23.000.

Kozljuk, Anatoly Ivanovich: *See*—
Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich, 4,113,019, Cl. 169-12.000.

Kozlov, Viktor Mikhailovich: *See*—
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, 4,113,833, Cl. 423-131.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Rohr, Karl, 4,113,324, Cl. 308-9.000.

Kramer, Franklin; Henig, Yair Steve; Garin, Torunn Atteraas; and Vogel, Gerald James, to General Foods Corporation. Adsorption process. 4,113,887, Cl. 426-422.000.

Kramer, John B., to Allied Chemical Corporation. Pressurizing fuel ram air charger. 4,112,899, Cl. 123-139.0AW.

Kramer, Vance M., Jr.: *See*—
Kramer, Vance M., Sr.; and Kramer, Vance M., Jr., 4,113,828, Cl. 264-294.000.

Kramer, Vance M., Sr.; and Kramer, Vance M., Jr. Method for making flexible corrugated rubber tubing and tubing produced thereby. 4,113,828, Cl. 264-294.000.

Krasovec, Branko; Mihelic, Eli; and Reutlinger, Suzana, to HP Kolinska Ljubljana Prehrambena Industrija (n.sol.o.). Process for the preparation of a concentrate from waste chicken-broth and product therefrom. 4,113,884, Cl. 426-56.000.

Krause, Alois, to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung. Double-hydraulic actuator. 4,112,824, Cl. 91-413.000.

Krauss, Guenter, to Siemens Aktiengesellschaft. Electromechanical filter having encapsulated input and terminal circuit capacitors. 4,114,118, Cl. 333-71.000.

Krawza, Walter G.: *See*—
Savanick, George A.; and Krawza, Walter G., 4,113,314, Cl. 299-4.000.

Krehl, William H.: *See*—
DeHart, John R.; Nelson, Larry L.; and Krehl, William H., 4,113,105, Cl. 209-549.000.

Kreiger, John W., to Bethlehem Steel Corporation. Green balls formed by agglomerating wet-collected fume produced in metallurgical furnaces. 4,113,481, Cl. 75-256.000.

Kreuzburg, Gerhard; Lenz, Arnold; and Rogler, Walter, to Dynamit Nobel Aktiengesellschaft. Method of preparing orthosilicic acid alkyl esters. 4,113,761, Cl. 260-448.80A.

Krippelz, Jacob. Method of cushioning and ventilating a foot, and footwear including disposable slippers and insoles for practicing such method. 4,112,599, Cl. 36-11.500.

Kroger, Carl; Romey, Ingo; and Kolling, Georg, to Bergwerksverband GmbH. Coal-containing shaped bodies and process for making the same. 4,113,817, Cl. 264-120.000.

Krogmann, Uwe Jonny: *See*—
Fuhrman, Gunther Georg; Krogmann, Uwe Jonny; and Schroth, Gerhard Wolfgang, 4,112,856, Cl. 110-165.00R.

Krohn, W. Henrik: *See*—
Lefkowitz, Leonard R.; and Krohn, W. Henrik, 4,113,535, Cl. 156-148.000.

Kronfeld, Mervin J., to Nortronics Company, Inc. Dispenser package for magnetic tape splicing tabs. 4,113,141, Cl. 221-70.000.

Krude, Werner, to Uni-Cardan AG. Double universal joint. 4,112,709, Cl. 64-21.000.

Kruger, Gerd: *See*—
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,113,777, Cl. 260-570.900.

Kruger, Hans, to Schering AG. Process for making 5-amino-1,2,3-thiadiazoles. 4,113,733, Cl. 260-306.80D.

Kruschik, Julius, to Klinger AG. Shutoff element. 4,112,965, Cl. 137-219.000.

Kruse, Hubert; and Opitz, Konrad, to Hoechst Aktiengesellschaft. Preparation of a disperse dyestuff containing a phosphoric acid ester, having improved safety properties and higher dyestuff yield when dyed on synthetic materials. 4,113,429, Cl. 8-90.000.

Krutov, Sergei Vasilievich: *See*—
Glushkov, Alexandr Ivanovich; Krutov, Sergei Vasilievich; Semenov, Vladimir Ivanovich; and Gusev, Anatoly Fedorovich, 4,112,547, Cl. 17-57.000.

Kubens, Rolf; and Gebauer, Herbert, to Bayer Aktiengesellschaft. Process for reinforcing geological formations. 4,113,014, Cl. 166-295.000.

Kubina, John, to Engineered Systems, Inc. Verification checking system. 4,114,140, Cl. 340-149.00A.

Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, to Nippon Telegraph and Telephone Public Corp.; and Matsushita Electric Industrial Co., Ltd. Frequency shift signal receiver. 4,114,097, Cl. 325-320.000.

Kubota, Ltd.: *See*—
Fukuta, Shigemi; Izaki, Hiroshi; and Yoshino, Shoichi, 4,113,002, Cl. 164-286.000.
Ozaki, Tsutomu; and Hijikata, Setsuo, 4,113,039, Cl. 177-25.000.

Kubota, Masayoshi: *See*—
Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, 4,113,608, Cl. 209-1.000.

Kubota, Munetaka: *See*—
Hosoya, Kazuo; and Kubota, Munetaka, 4,112,690, Cl. 405-57.000.

Kubotera, Haruo: *See*—
Nakaoka, Kazuhide; Araki, Kenzi; Nishimoto, Akihiko; Iwase, Kozi; and Kubotera, Haruo, 4,113,517, Cl. 148-2.000.

Kucharski, Lawrence, Jr.: *See*—
DeRouen, Joseph Rodolph; and Kucharski, Lawrence, Jr., 4,114,132, Cl. 338-174.000.

Kuhle, Engelbert: *See*—
Siegle, Peter; Kuhle, Engelbert; Hammann, Ingeborg; Homeyer, Bernhard; and Behrenz, Wolfgang, 4,113,876, Cl. 424-278.000.

Kuhlein, Klaus: *See*—
Linkies, Adolf; Reuschling, Dieter-Bernd; Kuhlein, Klaus; Beck, Gerhard; and Musil, Josef, 4,113,874, Cl. 424-274.000.

Kuhlmann, Wolf; and Rumpp, Gerhard, to Hilti Aktiengesellschaft. Expansion anchor assembly including a yielding member. 4,112,813, Cl. 85-74.000.

Kuhn, Hans Heinrich: *See*—
Hauser, Peter Jacob; and Kuhn, Hans Heinrich, 4,113,721, Cl. 260-178.000.

Kuhnle, Hans-Frieder: *See*—
Stach, Kurt, deceased; Bosies, Elmar; Heerdt, Ruth; Kuhnle, Hans-Frieder; and Schmidt, Felix Helmut, 4,113,871, Cl. 424-272.000.

Kuhnlein, Dieter: *See*—
Zeh, Werner; and Kuhnlein, Dieter, 4,114,182, Cl. 360-92.000.

Kuitunen, Robert. Fuel system modification. 4,112,908, Cl. 123-198.00F.

Kukhno, Viktor Ivanovich: *See*—
Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich, 4,113,019, Cl. 169-12.000.

Kulberg, Anton Yanovich: *See*—
Ryzhov, Vladimir Dmitrievich; Litvinenko, Semen Kirillovich; Leikin, Roman Samuilovich; Kulberg, Anton Yanovich; Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich, 4,113,142, Cl. 221-171.000.

Kulish, Stanley J., Jr.: *See*—
Abair, Raymond L.; and Kulish, Stanley J., Jr., 4,113,809, Cl. 261-81.000.

Kumamoto, Yoshito: *See*—
Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, 4,113,416, Cl. 431-1.000.

Kumar, Atul: *See*—
Ledoux, Will A.; Schoen, William; and Kumar, Atul, 4,113,013, Cl. 166-275.000.

Kume, Toshiaki: *See*—
Kakinuma, Toshihide; Kume, Toshiaki; Takenoya, Hideaki; Makabe, Hachiro; and Watanabe, Kazuo, 4,112,858, Cl. 112-158.00E.

Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, to BASF Aktiengesellschaft. Isolation and regeneration of rhodium-containing catalysts from distillation residues of hydroformylation reactions. 4,113,754, Cl. 260-429.00R.

Kuno, Masaya: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, 4,113,441, Cl. 422-197.000.

Kurandt, Hans-Friedrich; and Schliephake, Dietrich, to Veba-Chemie Aktiengesellschaft. Process for preparing pure synthetic calcium sulfate semihydrate. 4,113,835, Cl. 423-170.000.

Kuraray Co., Ltd.: *See*—
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,113,968, Cl. 560-124.000.

Kurata, Kenichi: *See*—
Matsunaga, Kazuo; Ishizawa, Hideo; and Kurata, Kenichi, 4,113,487, Cl. 96-38.100.

Kurihara, Takao: *See*—
Uchida, Kuniki; Araki, Kenzi; Narita, Hirosi; Fukunaka, Shiro; and Kurihara, Takao, 4,113,523, Cl. 148-12.300.

Kuriyama, Masao: *See*—
Terada, Yasuhiko; Yasuda, Jun; and Kuriyama, Masao, 4,113,431, Cl. 8-120.000.

Kurkov, Victor P., to Chevron Research Company. Process for the production of N-acetyl-2-pyrrolidone. 4,113,735, Cl. 260-326.5FL.

Kurtz, Leonard D.; and Bidwell, Robert E., to Deknatel, Inc. Surgical drainage system with pressure indicator and enclosed source of liquid. 4,112,948, Cl. 128-276.000.

Kurz, German: *See*—
von Linde, Robert; von Linde, Joachim; and Kurz, German, 4,113,425, Cl. 431-352.000.

Kusunose, Takamaro: *See*—
Fukushima, Keitaro; Kusunose, Takamaro; and Nosaka, Yoshinori, 4,113,847, Cl. 423-447.400.

Kuzma, Edward J.: *See*—
Patella, Ralph F.; and Kuzma, Edward J., 4,113,540, Cl. 156-327.000.

Kyokuto Electric Company, Limited: *See*—
Kiuchi, Mitsuyuki; Amagami, Keizo; Maeda, Shigeru; and Saegusa, Shigeharu, 4,114,009, Cl. 219-10.49R.

La Nationale S.A.: *See*—
Guenin, Andre, 4,113,422, Cl. 431-124.000.

Labogiken Co., Ltd.: *See*—
Osanai, Shinichi, 4,113,192, Cl. 242-1.000.

Laconte, Susana S.: *See*—
Gauron, Richard F.; and Laconte, Susana S., 4,113,292, Cl. 292-165.000.

Lacour, Alain P.: *See*—
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., 4,113,951, Cl. 544-360.000.

Laenen, Rene Johannes: *See*—
Einerhand, Johan Jozef; Erkens, Leonardus Johannes Hubertus; Laenen, Rene Johannes; and Hoofs, Joseph Wilhelmus Jacobus, 4,113,508, Cl. 106-304.000.

LaFitte, Larry L.; and Camden, James B., to Buckeye Cellulose Corporation, The. Quiet, strong cloth-like tissue laminate. 4,113,911, Cl. 428-284.000.

Lagow, Richard J.; Adcock, James L.; and Maraschin, Norma J., to Massachusetts Institute of Technology. Cryogenically controlled direct fluorination apparatus. 4,113,435, Cl. 422-191.000.

Lagow, Richard J.; and Inoue, Shoji. Method for producing perfluoroether oligomers having terminal carboxylic acid groups. 4,113,772, Cl. 562-583.000.

Lajeuness, John B. Waste water reclamation apparatus. 4,112,972, Cl. 137-597.000.

Lakhtjukhov, Valery Mikhailovich: *See*—
Vasiliev, Vladimir Sergeevich; Annenberg, Ernest Alexandrovich; Livshits, Abram Lazarevich; Polotsky, Vadim Evgenievich; and Lakhtjukhov, Valery Mikhailovich, 4,114,015, Cl. 219-69.00W.

Lallinger, Georg, to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung. Warhead construction. 4,112,848, Cl. 102-69.000.

Lam, Hung-Kei H.: *See*—
Bell, Norman; Andersen, John N.; and Lam, Hung-Kei H., 4,113,832, Cl. 423-119.000.

Lammert, Wayne F.; Simpson, Dayton M.; and Desai, Ardeshir R., to Brown & Root, Inc. Articulated stinger. 4,112,698, Cl. 405-167.000.

Lampert, Murray Alfred: *See*—
Pankove, Jacques Isaac; and Lampert, Murray Alfred, 4,113,514, Cl. 148-1.500.

Lang, Gary E.: *See*—
Lang, Roger J.; and Lang, Gary E., 4,113,335, Cl. 339-29.00R.

Lang, Karl: *See*—
Werder, Roger Daniel; Meier, Linus; and Lang, Karl, 4,113,436, Cl. 422-65.000.

Lang, Roger. Solar-ray heating apparatus. 4,112,917, Cl. 126-270.000.

Lang, Roger J.; and Lang, Gary E., to Eltra Corporation. Re-formable multi-conductor flat cable. 4,113,335, Cl. 339-29.00R.

Lang, Winfried: *See*—
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, 4,113,532, Cl. 148-174.000.

Langdon, William Keith: *See*—
Helfert, Herbert; Davis, Pauls; and Langdon, William Keith, 4,113,785, Cl. 260-615.00B.

Lange, Daniel J., to P. D. George Company, The. Aromatic imino acids and resins derived therefrom. 4,113,706, Cl. 528-289.000.

Langhorst, Martin A.; Sinke, Gerard C.; and Mossner, Elmer H., to Dow Chemical Company, The. Extraction of non-ferrous metal values from dolomitic oxide ores. 4,113,471, Cl. 75-101.00R.

Lanier Business Products, Inc.: *See*—
Bolick, Fred C., Jr.; and Titus IV, Theodore, 4,113,994, Cl. 179-100.1DR.

Lantzsch, Reinhard, to Bayer Aktiengesellschaft. Preparation of 2,2-dimethyl-3-(2,2-dihalogenovinyl)-cyclopropane-1-carboxylic acid esters. 4,113,969, Cl. 560-124.000.

Lappage, James; Doggett, Neil; and Yates, Stephen William, to Platt Saco Lowell Limited. Winding machines. 4,112,662, Cl. 57-34.0AT.

Laqua, Arnold; and Holtschmidt, Ulrich, to Th. Goldschmidt AG. Method for the preparation of hardenable urea formaldehyde resins. 4,113,701, Cl. 260-29.40R.

Larcen, Donald W. Rotary burner control. 4,113,418, Cl. 431-12.000.

Larimore, Frank C., to Minnesota Mining and Manufacturing Company. Electrode and magnetic connector assembly. 4,112,941, Cl. 128-2.06E.

Larock, Richard C., to Iowa State University Research Foundation. Synthesis of prostaglandin precursors. 4,113,755, Cl. 260-429.00L.

Larson, John Arden; and Fischer, Robert Bowlby, to Ingersoll-Rand Company. Chrome steel casting. 4,113,527, Cl. 148-36.000.

Larson, Paul: *See*—
Cook, Glenn; and Larson, Paul, 4,113,586, Cl. 204-105.00R.

Lartigau, Guy: *See*—
Bost, Pierre-Etienne; and Lartigau, Guy, 4,113,779, Cl. 260-592.000.

Lasag AG: *See*—
Von Allmen, Martin; and Schwob, Hans Peter, 4,114,018, Cl. 219-121.0LM.

Latsch, Reinhard: *See*—
Assenheimer, Jurgen; Bianchi, Valerio; Brettschneider, Johannes; Latsch, Reinhard; and Scherenberg, Dieter, 4,112,879, Cl. 123-32.0EA.

Latypov, Anvar Latypovich; and Abrarov, Vakif Barievich. Apparatus for surgical treatment of scoliosis. 4,112,935, Cl. 128-69.000.

Lauer, James L.; and Peterkin, Melvin E., to Suntech, Inc. Viscosity measuring system. 4,113,384, Cl. 356-70.000.

Laufer, Jay K.: *See*—
Watt, William R.; Astolfi, Edmund G.; and Laufer, Jay K., 4,113,895, Cl. 427-44.000.

Laumann, Eugene A.: *See*—
United States of America, National Aeronautics and Space Administration; Laumann, Eugene A.; and Reynolds, Rollin K., 4,112,875, Cl. 123-1.00A.

Laundon, Brian; Cowley, Brian Richard; and Humber, David Cedric, to Glaxo Laboratories Limited. Preparation of cephalosporin compounds. 4,113,591, Cl. 204-158.0HA.

Laviolette, Maurice A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Modular practice bomb. 4,112,843, Cl. 102-7.600.

Law, Gabriel H.; and Gysegem, Albert Peter, to Ameron, Inc. Coatings prepared from trialkoxysilanes. 4,113,665, Cl. 260-37.0SB.

Lawler, James E.: *See*—
Fitzsimmons, William A.; and Lawler, James E., 4,112,580, Cl. 33-174.00S.

Lawrence, Jackson: *See*—
Troope, Walter S.; and Lawrence, Jackson, 4,112,559, Cl. 26-18.600.

Lawrence, Walter W., Jr.; McKay, Tom W.; and Wiegand, Karl E., to Ethyl Corporation. Process for the purification of citric acid. 4,113,771, Cl. 562-568.000.

Laws, Cecil Alfred: *See*—
Laws, Christopher Malcolm, 4,114,088, Cl. 324-33.000.

Laws, Christopher Malcolm, to Laws, Cecil Alfred. Atmospheric ion density measurement. 4,114,088, Cl. 324-33.000.

Lawton, William R. Curl-resistant adhesive-coated paper. 4,113,900, Cl. 427-207.00R.

Lazenby, Webber W.; and Pulliam, Daniel N., to McDonnell Douglas Corporation. Joint for a nestable cargo carrier. 4,113,130, Cl. 220-5.00A.

Leach, Harry Woods; Hebeda, Ronald Emil; and Holik, Dennis John, to CPC International Inc. Enzymatically produced maltose-maltotriose starch hydrolysate. 4,113,509, Cl. 127-29.000.

Leach, Sam L. High intensity energy transfer technique. 4,113,589, Cl. 204-157.10R.

Leason, Hayden L., to Filtertek, Inc. Process for making hermetically sealed filter units and filters made thereby. 4,113,627, Cl. 210-446.000.

Lecce, Giovanni; and Andena, Paolo, to Leyan S.r.l. Camping tool, in particular for driving and extracting from the ground anchorage pegs of camping tents. 4,112,530, Cl. 7-146.000.

Leccese, Antonio: *See*—
Mayr, Adolfo; Davoli, Velmore; Leccese, Antonio; and Susa, Ermanno, 4,113,654, Cl. 252-429.00C.

Lecolier, Serge L.; and Biehler, Jean-Marie J., to Societe Nationale des Poudres et Explosifs. Carbamate-phosphonates as flame-proofing agents in polyurethane foam. 4,113,671, Cl. 521-108.000.

Lednicer, Daniel, to Upjohn Company, The. Analgetic compounds, compositions and process of treatment. 4,113,866, Cl. 424-248.560.

Ledoux, Will A.; Schoen, William; and Kumar, Atul, to Texaco Inc. Asphaltenes as sacrificial agents in oil recovery processes. 4,113,013, Cl. 166-275.000.

Lee, Arthur L.; and Coval, Arthur B., to A. L. Lee Corporation. Interrelated controls for vehicle brakes, transmission and motor. 4,113,076, Cl. 192-4.00A.

Lee, Cyril Arthur, to E M I Limited. Magnetic recording. 4,114,029, Cl. 235-449.000.

Lee, Gim Fun, Jr., to General Electric Company. Thermoplastic molding compositions of rubber modified copolymers of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride. 4,113,797, Cl. 260-876.00B.

Lee, Gim Fun, Jr., to General Electric. High impact polyphenylene ether resin compositions that include A-B-A block copolymers. 4,113,800, Cl. 260-876.00B.

Lee, Haeng Yong. Three-way slide fastener. 4,112,552, Cl. 24-205.00R.

Lee, Joseph Y.: *See*—
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., 4,113,922, Cl. 429-33.000.
Lee, Richard M.; and Szema, Li C., to Westinghouse Electric Corp. Cooling system for a gas turbine engine. 4,113,406, Cl. 415-115.000.
Leek, Stanley, to Hawker Siddeley Dynamics Limited. Auxiliary control of vehicle direction. 4,113,204, Cl. 244-3.210.
Lefkowitz, Leonard R.; and Krohn, W. Henrik, to Huyck Corporation. High temperature filter fabrics. 4,113,535, Cl. 156-148.000.
Leger, Pierre: *See*—
Salles, Yvon; Leger, Pierre; and David, Gerard Andre, 4,113,543, Cl. 156-345.000.
Leggett & Platt, Incorporated: *See*—
Adams, Elvin E.; Wells, Tom J.; Wentzek, Horst F.; Zapletal, Henry; and Zugel, Marty J., 4,112,726, Cl. 72-137.000.
Hampton, Edward L., 4,113,305, Cl. 297-69.000.
Higgins, Larry, 4,112,528, Cl. 5-248.000.
Lehmann, Gerhard: *See*—
Werner, Paul; Wirtz, Egon; and Lehmann, Gerhard, 4,113,308, Cl. 297-362.000.
Lehmkuhl, Herbert; and Rabet, Farroch, to Studiengesellschaft Kohle mbH. Method for the solubilizing of alkali metal salts with polyethyleneglycoldiethers and the utilization thereof. 4,113,649, Cl. 252-363.500.
Lehtinen, Jukka A., to Oy. Tampella AB. Method of drying a cardboard or a paper web and drying device for applying this method. 4,112,586, Cl. 34-9.000.
Leikin, Roman Samuilovich: *See*—
Ryzhov, Vladimir Dmitrievich; Litvinenko, Semen Kirillovich; Leikin, Roman Samuilovich; Kulberg, Anton Yanovich; Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich, 4,113,142, Cl. 221-171.000.
Leinonen, Erkki Ilmari; and Kiuru, Erkki Sakari, to Outokumpu Oy, Ab. Method of improving the temperature stability of a voltage source, and a stabilized voltage source for carrying out the method. 4,114,085, Cl. 323-17.000.
Leiter, Robert, to Webasto-Werk W. Baier GmbH & Co. Sliding and tilting roof for a motor vehicle. 4,113,304, Cl. 296-137.00G.
Leitold, Matyas: *See*—
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,113,777, Cl. 260-570.900.
Lelental, Mark; and Light, William Andrew, to Eastman Kodak Company. Electrophotographic elements and processes. 4,113,484, Cl. 96-1.00R.
LeMay, Christopher Archibald Gordon, to EMI Limited. Radiography. 4,114,042, Cl. 250-445.00T.
Lentsbergs, Ivars Petrovich: *See*—
Aren, Avgust Karlovich; Berzinya, Irma Arnoldovna; and Lentsbergs, Ivars Petrovich, 4,113,948, Cl. 544-152.000.
Lenz, Arnold: *See*—
Kreuzburg, Gerhard; Lenz, Arnold; and Rogler, Walter, 4,113,761, Cl. 260-448.80A.
Lepper, James M., Jr., to Climet Instruments Company. Photometer. 4,113,386, Cl. 356-103.000.
Lerche, Heinz, to Varian Mat GmbH. Integrating circuit. 4,114,050, Cl. 307-229.000.
Lerman, Michael J.: *See*—
Schlosberg, Seymour; and Lerman, Michael J., 4,112,572, Cl. 29-401.00R.
Lesas, Claude H.; and Pierre, Michel, to S. A. Beghin-Say. Cross-linking of cellulose fibers in gas suspension. 4,113,936, Cl. 536-56.000.
Leser, Robert: *See*—
Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, 4,113,760, Cl. 260-448.20E.
Levart, Michel Marc: *See*—
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Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, to Saint-Gobain Industries. Fiberization energy conservation. 4,113,456, Cl. 65-5.000.
Leveen, Harry H.; and Joyce, Patrick J. Microbiocidal composition and articles prepared therefrom. 4,113,851, Cl. 424-28.000.
Levine, Walter E., to Bindicator Company. Optical sight tube for fluid conduits. 4,113,390, Cl. 356-201.000.
Lewis, Barry R. Mast stepping and unstepping structure. 4,112,861, Cl. 114-91.000.
Lewis, John C., to Park-Ohio Industries, Inc. Test circuit and method for matching an induction load to a solid state power supply. 4,114,010, Cl. 219-10.410.
Lewis, Richard Newton, to SWS Silicones Corporation. Silicone elastomers containing alkoxysiloxanols. 4,113,690, Cl. 260-37.0SB.
Leyan S.r.l.: *See*—
Lecce, Giovanni; and Andena, Paolo, 4,112,530, Cl. 7-146.000.
Liaaen, Anders Marius, to A.M. Liaaen A/S. Propeller mechanism having removable propeller shaft. 4,112,866, Cl. 115-34.00R.
Libbey-Owens-Ford Company: *See*—
Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., 4,113,162, Cl. 225-2.000.
Liberman, Harvey W.; and Whitehead, James Stephen, to Carrier Corporation. Methods and apparatus for controlling an hydraulic cylinder. 4,112,823, Cl. 91-36.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Keiner, Hildegard; Schmid, Emil; and Richly, Walter, 4,113,896, Cl. 427-108.000.
Klank, Otto, 4,114,100, Cl. 325-453.000.
Stiltz, Erwin; Hoyer, Rudolf; and Lindenmayer, Heinz, 4,113,035, Cl. 173-116.000.
Lieber, Raymond S. Noise reduction device for impact tools. 4,113,049, Cl. 181-230.000.
Liebman, Alan: *See*—
Fraser, Lawrence J.; and Liebman, Alan, 4,113,371, Cl. 355-4.000.
Liermann, Peter: *See*—
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Light, William Andrew: *See*—
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Lin Offshore Engineering, Inc.: *See*—
Chow, Philip Y., 4,112,697, Cl. 405-209.000.
Lindberg, John E., to Owen, Wickersham & Erickson. Combustion control system for adding fluid above the butterfly valve. 4,112,892, Cl. 123-119.00A.
Lindblad, Lars Alfred, to Atlas Copco Aktiebolag. Method and arrangement for positioning a working tool to a predetermined direction and/or a predetermined point. 4,113,033, Cl. 173-1.000.
Linde Aktiengesellschaft: *See*—
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Lindenmayer, Heinz: *See*—
Stiltz, Erwin; Hoyer, Rudolf; and Lindenmayer, Heinz, 4,113,035, Cl. 173-116.000.
Linder, Gerald S. Adjustable frame assembly for supporting a surgical tray. 4,113,218, Cl. 248-291.000.
Lindner, Gerhard: *See*—
Helfgen, Werner; Lindner, Gerhard; Lingens, Paul; and Kaufmann, Helmut, 4,113,811, Cl. 264-3.00R.
Lingens, Paul: *See*—
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Linkies, Adolf; Reuschling, Dieter-Bernd; Kuhlein, Klaus; Beck, Gerhard; and Musil, Josef, to Hoechst Aktiengesellschaft. Pyrrolidones, pharmaceutical compositions therewith and processes of use thereof. 4,113,874, Cl. 424-274.000.
Lippacher, Wolfgang; and Teger, Gerhard, to Hilti Aktiengesellschaft. Depth stop for a drilling machine. 4,113,404, Cl. 408-241.00S.
Lissner, Reinhard: *See*—
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, 4,113,863, Cl. 424-205.000.
Litteral, Carl J., to Union Carbide Corporation. Disproportionation of chlorosilane. 4,113,845, Cl. 423-342.000.
Litton Systems, Inc.: *See*—
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Litvinenko, Semen Kirillovich: *See*—
Ryzhov, Vladimir Dmitrievich; Litvinenko, Semen Kirillovich; Leikin, Roman Samuilovich; Kulberg, Anton Yanovich; Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich, 4,113,142, Cl. 221-171.000.
Liu, Cheng-Yih: *See*—
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Livesey, Donald V.: *See*—
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Livorsi, Carl F.: *See*—
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Lock, Alan Howard: *See*—
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Lockheed Corporation: *See*—
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Loew, Peter; and Koller, Stefan, to Ciba-Geigy Corporation. Basic azo dyes. 4,113,718, Cl. 260-147.000.
Logan, James D.: *See*—
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Logutov, Igor Jurievich: *See*—
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Long, Lewis Frank, to Everett/Charles, Inc. Network testing method and apparatus. 4,114,093, Cl. 324-73.0AT.
Long, Marshall, to Marlen Research Corporation. Method of cooking a

flowable food product in a continuous flow scraped surface heat exchanger. 4,113,890, Cl. 426-512.000.

Lonstrup, Thorkild F.; Brownawell, Darrell W.; Goletz, Edward, Jr.; and Numair, Solomon J., to Exxon Research & Engineering Co. Lubricating oil composition containing a dispersing-varnish inhibiting combination of an oxazoline compound and an acyl nitrogen compound. 4,113,639, Cl. 252-51.50A.

Loqvist, Kaj-Ragnar, to Seco Tools Aktiebolag. Method of making a composite roller. 4,112,564, Cl. 29-148.40D.

Lostutter, Rollie. Method for tinting caulk. 4,114,196, Cl. 366-348.000.

Loughrie, Gregory D., to CF Industries, Inc. Wet grinding method for crude phosphate rock. 4,113,184, Cl. 241-15.000.

Louthan, Rector P.; and Doss, Richard C., to Phillips Petroleum Company. Poly(oxyalkylene)-polyester-poly(sulfide)-polythiol prepared by ester interchange. 4,113,707, Cl. 528-279.000.

Loyd, Morris S., to Rockwell International Corporation. Composite load coupler for reinforcing composite structural joints. 4,113,910, Cl. 428-162.000.

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Lucas Industries Limited: *See—*
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Lumby, Roland John; North, Bernard; and Taylor, Alfred James, to Lucas Industries Limited. Method of forming a ceramic product. 4,113,503, Cl. 106-73.400.

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Lunden, Risto Waldemar: *See—*
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Lupfer, David A., to Dielectric Laboratories, Inc. Stripline capacitor. 4,114,120, Cl. 333-84.00M.

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Lutz, David Edward. Loading and unloading apparatus for vehicles. 4,113,122, Cl. 214-82.000.

Lyssy, Georges H. Process and apparatus for the isostatic measurement of the permeability of a material to the passage therethrough of a gas or vapor. 4,112,739, Cl. 73-38.000.

M. E. Heuck Company: *See—*
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Maa, Peter S.: *See—*
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Maass, Edward A.; and Stoneberg, William A., to Magnecorp, Inc. Shelf management device. 4,112,598, Cl. 35-53.000.

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MacCracken, Calvin Dodd, to Calmac Manufacturing Corporation. Method and system for utilizing a flexible tubing solar collector. 4,112,921, Cl. 126-271.000.

Mackenzie, Raymond W.: *See—*
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MacLean, Donald L.; and Estes, Robert T., to Monsanto Company. Polyester filament-forming polymer and its method of production. 4,113,704, Cl. 528-289.000.

MacLennan, P. H. Barry; Ireland, Graham A.; and Werba, William J., to Canadian Patents and Development Limited. Ultrasonic air data system. 4,112,756, Cl. 73-181.000.

Maeda, Masaya: *See—*
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Magnecorp, Inc.: *See—*
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Magnusson, Alan B.: *See—*
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Mahar, Kevin D., to Donner-Hanna Coke Corporation. Coke air pollution control method and apparatus. 4,113,569, Cl. 201-39.000.

Maier, Alfred E.; Armstrong, Donald D.; and Farley, James R., to Westinghouse Electric Corp. Circuit breaker spring assembly. 4,114,005, Cl. 200-153.00G.

Maierhofer, Alfred: *See—*
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Maki, Masao; Kaneko, Yasunori; Tsuruda, Kunihiro; and Kobayashi, Ikuo, to Matsushita Electric Industrial Co., Ltd. Nitrogen oxides removal method. 4,113,839, Cl. 423-239.000.

Makurin, Pavel Semenovich: *See—*
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Malinski, Richard F.; and Childers, Aubrey C. Mechanical torque limit for valve actuator. 4,114,078, Cl. 318-475.000.

Maloney, Thomas C.; and Cola, Rudolph A., to Burroughs Corporation. Display panel with phosphors. 4,114,148, Cl. 340-343.000.

Malpass, Dennis B.; and Yeargin, G. Scott, to Texas Alkyls, Inc. Reduction of triphenylphosphine oxide to triphenylphosphine. 4,113,783, Cl. 260-606.50P.

Manabe, Kenshi; and Satou, Kouichirou, to Tokyo Shibaura Electric Co., Ltd. Presettable dynamic delay flip-flop circuit. 4,114,052, Cl. 307-279.000.

Manda, John G.; Burroughs, Joe D.; and Cairns, Donald F., to National Steel Corporation. Pollution control system including a one-spot quench-car for coke producing installations. 4,113,572, Cl. 202-227.000.

Manfredi, Dario John. Airchute ejection. 4,113,208, Cl. 244-139.000.

Manger, Hansjorg; Sohner, Gerhard; and Hohne, Gerd, to Robert Bosch GmbH. Controlled ignition system for an internal combustion engine to provide, selectively, one or more ignition pulses for any ignition event. 4,112,890, Cl. 123-117.00R.

Mann, Gamdur S., to General Motors Corporation. Method of making electric heater. 4,112,577, Cl. 29-611.000.

Manufacturers Systems, Inc.: *See—*
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Manufacturing Approaches & Total Concepts, Inc.: *See—*
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Marcade, Roque Denis, to Whirlpool Corporation. Drier appliance control. 4,112,588, Cl. 34-45.000.

Marchetti, Silvano. Device for monitoring absolute velocity of points of driven piles during impact. 4,112,733, Cl. 73-12.000.

Marden Manufacturing Company, Inc.: *See—*
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Margalit, Nehemiah, to ESB Incorporated. Non-aqueous primary battery having a pure silver chromate cathode. 4,113,929, Cl. 429-194.000.

Margen, Peter Heinrich Erwin; and Naslund, Rolf Paul, to Aktiebolaget Atomenergi. Method of manufacturing a heat exchanger. 4,112,569, Cl. 29-157.30R.
Marhic, Michel E.: *See—*
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Marino, Angelo. Tape reel holder. 4,113,199, Cl. 242-106.000.
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Carlson, Donald E., 4,112,966, Cl. 137-282.000.
Mark, Victor, to General Electric Company. Non-opaque flame-retardant polycarbonate composition. 4,113,695, Cl. 260-45.80N.
Mark, Victor; and Hedges, Charles Vernon, to General Electric Company. Process for purifying impure diphenols. 4,113,974, Cl. 568-750.000.
Marketing Masters: *See—*
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Markovski, Ognian. Hand held device for packing grease into wheel bearings. 4,113,059, Cl. 184-1.00D.
Marks, Thomas L. Telephone cradle adapter. 4,113,995, Cl. 179-146.00R.
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Marsh, Charles W. Hair dryer. 4,112,591, Cl. 34-99.000.
Marsh, Paul G.; and Kohlhepp, Dean H., to Black Clawson Fibreclaim, Inc. Process for producing fuel from solid waste. 4,113,185, Cl. 241-21.000.
Martensson, Folke Lennart, to Telefonaktiebolaget L M Ericsson. Arrangement to indicate signals having a length exceeding a limit value. 4,114,106, Cl. 328-111.000.
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Masco Corporation of Indiana: *See—*
Pflasterer, Peter W., 4,114,103, Cl. 325-470.000.
Maselli, Vincent M. Process for making photo-mechanical drop-out mask. 4,113,485, Cl. 96-5.000.
Mason, Russell I.; and Dale, John R., to United States of America, Navy. Directional sonobuoy. 4,114,137, Cl. 340-85.000.
Masri, Merle S.; Randall, Virginia G.; and Stanley, William L., to United States of America, Agriculture. Insolubilization of enzymes on modified phenolic polymers. 4,113,567, Cl. 195-63.000.
Massachusetts Institute of Technology: *See—*
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Masuda, Bunpei: *See—*
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Masuda, Hajime: *See—*
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Matsubara, Masaki, to Olympus Optical Co., Ltd. Zoom lens system with high zooming ratio. 4,113,356, Cl. 350-186.000.
Matsui, Takashi; Sugimura, Sadao; and Noo, Kunio, to Sekisui Kaseikin Kogyo Kabushiki Kaisha. Process for producing receptacles from a thermoplastic resin foam sheet. 4,113,824, Cl. 264-230.000.
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Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; and Suzuki, Shosuke, to Bridgestone Tire Company Limited. Sound absorbing body. 4,113,053, Cl. 181-284.000.
Matsumura, Shiunzi: *See—*
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Matsunaga, Kazuo; Ishizawa, Hideo; and Kurata, Kenichi, to Toppan Printing Co., Ltd. Method for manufacture of expanded articles having an embossed surface. 4,113,487, Cl. 96-38.100.
Matsunami, Shoichi: *See—*
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Matsuoka, Shingo: *See—*
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Matsushita, Akira. Information processing optical device. 4,113,353, Cl. 350-171.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
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Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, 4,114,097, Cl. 325-320.000.
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Matsuura, Ryo; Nakatani, Shuichi; Nagaoka, Kazuya; and Hioki, Katsuhiko, to Kawasaki Kasei Chemicals Ltd. Process for producing anthrone. 4,113,749, Cl. 260-351.000.
Matteoli, Mario; and Luciani, Luciano, to Montedison S.p.A. Process for preparing polypropylene compositions having high impact strength at low temperatures. 4,113,802, Cl. 260-878.00B.
Mattmuller, Rene, to Saint-Gobain Industries. Method and apparatus for melting mineral materials. 4,113,459, Cl. 65-135.000.
Mattuschka, Werner, to Siemens Aktiengesellschaft. Thickness shear resonator for use as an over-tone quartz crystal. 4,114,062, Cl. 310-326.000.
Maurer, Fritz; Riebel, Hans-Jochem; Homeyer, Bernhard; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. O-alkyl-O-[4-alkylpyrimidin(2)yl]-(thiono)-(thiol) phosphoric (phosphonic) acid esters and insecticidal, acaricidal and nematocidal compositions containing them. 4,113,860, Cl. 424-200.000.
Maycock, Ian Commander, to Automotive Products Limited. Driven plates for friction clutches. 4,113,078, Cl. 192-107.00C.
Mayr, Adolfo; Davoli, Velmore; Leccese, Antonio; and Susa, Ermanno, to Montecatini Edison S.p.A. Catalysts for the polymerization of olefins. 4,113,654, Cl. 252-429.00C.
Mazdiyasni, Khodabakhsh S.; and Cooke, Charles M., to United States of America, Air Force. Method of fabricating silicon nitride bodies. 4,113,830, Cl. 264-101.000.
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McBrien, Roderick Julian, to Chloride Group Limited. Cell racks. 4,113,926, Cl. 429-99.000.
McCabe, Barkman C.; and Zajac, Edward, to Magna Energy, Inc. High temperature geothermal energy system. 4,112,745, Cl. 60-641.000.
McCabe, Francis J. Rotating blade fire damper. 4,113,230, Cl. 251-305.000.
McCabe, Francis J. Smoke, fire and air control damper with stamped blade. 4,113,232, Cl. 251-305.000.
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McCool, John B., 3rd: *See—*
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McDevitt, Robert F. Molten metal sampler. 4,112,770, Cl. 73-425.40R.
McDevitt, Robert F. Device for receiving a sample of molten metal. 4,112,771, Cl. 73-425.40R.
McDevitt, Robert F. Device and method for obtaining a sample of liquid. 4,112,772, Cl. 73-425.40R.

McDonald, Charles H. Method of pavement repair. 4,113,401, Cl. 404-75.000.

McDonnell, Damien Gerard: *See—*
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McDonnell Douglas Corporation: *See—*
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McGahee, Welbourne D. Method and apparatus for fabricating fishing lures etc. 4,112,608, Cl. 43-42.090.

McGarry, Francis J.; Greene, Donald; and Otto, Jeffrey B., to Rogers Corporation. Method of manufacturing insulating board. 4,113,554, Cl. 162-123.000.

McGraw-Edison Company: *See—*
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McGregor, William H.: *See—*
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McHenry, Donald L.; and Bechtel, Charles H., to PPG Industries, Inc. Method of preparing a solution for making electroconductive tin oxide films. 4,113,507, Cl. 106-287.180.

McKay, Tom W.: *See—*
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McKee, Harry A. Miniaturized model kitchen having coordinated interchangeable and integratable modules. 4,114,167, Cl. 354-81.000.

McKee, William H., to TRW Inc. Connector constructions and attaching means therefor. 4,113,179, Cl. 339-91.00R.

McKee, William H., to TRW Inc. Connector constructions and mounting means and hoods therefor. 4,113,337, Cl. 339-91.00R.

McKinney, Lynn B.: *See—*
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McLean, Graham Wilson; and Holt, David, to Strathearn Audio Limited. Electric motor. 4,114,060, Cl. 310-163.000.

McMaster, James David. Secret compartment case. 4,113,332, Cl. 312-204.000.

McPherson, Neil Soden. Meeting rail for sliding windows. 4,112,623, Cl. 49-488.000.

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Meijs, Franciscus H., to Shell Oil Company. Process for treating wells with viscous epoxy-resin-forming solutions. 4,113,015, Cl. 166-295.000.

Meiner, George H., III: *See—*
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Melnick, Igor, to Commissariat a l'Energie Atomique. Evaporation source for vacuum deposition. 4,113,978, Cl. 13-22.000.

Melocik, Grant C., to Towmotor Corporation. Control apparatus. 4,114,047, Cl. 307-9.000.

Melton, Rosser B., Jr.; Colburn, John W., Jr.; and Wood, Charles D., III, to Southwest Research Institute. Combustion apparatus for generating repetitive explosions. 4,113,315, Cl. 299-13.000.

Meng, Ilse Heide Frieda, heir: *See—*
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Meng, Ilse Heide Frieda, heiress: *See—*
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Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,113,872, Cl. 424-273.00P.

Meng, Karl-August, deceased: *See—*
Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,113,957, Cl. 548-377.000.

Mentschel, Hellmuth, to Siemens Aktiengesellschaft. Method and apparatus for starting up a gas generator for converting hydrocarbons into a fuel gas, and an internal combustion engine to be supplied with the fuel gas. 4,112,876, Cl. 123-3.000.

Menzi, Ulrich, to Hermes Precisa International S.A. Mechanism for actuating a member of a typewriter. 4,113,081, Cl. 400-333.000.

Menzin, Marvin: *See—*
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Merck & Co., Inc.: *See—*
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Merz, Walter, to Bayer Aktiengesellschaft. Process for the preparation of alkali metal salts of 3,3-dimethyl-2-oxo-butyric acid. 4,113,767, Cl. 562-577.000.

Meshberg, Philip. Dispensing unit for liquid and method of dispensing. 4,113,145, Cl. 222-1.000.

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Meyer, Robert W.; and Hall, George A., III, to Holcroft & Company. Heat exchanger core for recuperator. 4,113,009, Cl. 165-154.000.

Meyers, George Leroy, to American Can Company. Tamperproof reclosable carton. 4,113,104, Cl. 206-626.000.

Michalko, Edward, to UOP Inc. Catalytic composite and method of manufacture. 4,113,659, Cl. 252-455.00Z.

Michishita, Kazuhiko: *See—*
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Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Sobolev, Valerian Mikhailovich; Rutman, Grigory Iosifovich; Logutov, Igor Jurievich; and Dolidze, Vladimir Romanovich. Method of preparing 2,6-di-tert.butylphenol. 4,113,976, Cl. 568-789.000.

Mickelson, Grant A., to Union Oil Company of California. Catalytic hydrofining process. 4,113,605, Cl. 208-216.000.

Midana, Fiorenzo. Golfer's club swing and stance training device. 4,113,258, Cl. 273-186.00C.

Mieyal, David F., to Donn Products, Inc. Adjustable pedestal for elevated floors. 4,113,219, Cl. 248-354.00R.

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Miller, Stephen J., to Chevron Research Company. Denitrification process for hydrogenated distillate oils. 4,113,607, Cl. 208-254.00R.

Miller, Stephen L.; and Dickert, Yancey J., to Dow Chemical Company, The. Poly-2-alkyl-2-oxazoline modified regenerated cellulosics. 4,113,674, Cl. 260-9.000.

Milliken Research Corporation: *See—*
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Otto, Wolfgang K. F., 4,113,432, Cl. 8-125.000.
Willbanks, Charles E., 4,112,560, Cl. 28-160.000.

Mills, Anthony Mark; and Buck, David Lyndon, to Dunlop Limited. Pneumatic tires having low aspect ratio. 4,112,994, Cl. 152-354.00R.

Min, Tony C.; and Hergert, Richard E., to Beloit Corporation. Appara-

tus for deflocculating fibrous wad and uniformly distributing the disintegrated fibrous material on a dry fiber layer forming surface. 4,112,549, Cl. 19-304.000.
Minagawa, Motonobu; Ohzeki, Toshio; and Sekiguchi, Tetsuo, to Argus Chemical Corporation. Tin sulfide stabilizer for styrene polymer. 4,113,678, Cl. 260-23.70M.
Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Rotation control system. 4,114,075, Cl. 318-341.000.
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Hensley, William G., 4,113,194, Cl. 242-43.00R.
Howard, Robert N., 4,112,631, Cl. 51-295.000.
Larimore, Frank C., 4,112,941, Cl. 128-2.06E.
Minnis, Thomas R., to California Microwave, Inc. Compandor apparatus. 4,114,115, Cl. 333-14.000.
Minolta Camera Kabushiki Kaisha: *See*—
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Nakamura, Yoshihiro; Shibazaki, Kenji; Kono, Tateomi; Inagaki, Syotaro; and Murata, Tomoji, 4,113,374, Cl. 355-14.000.
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Mischutin, Vladimir, to White Chemical Corporation. Flame retardants for natural and synthetic materials. 4,113,902, Cl. 427-390.00D.
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Mitsubishi Denki Kabushiki Kaisha: *See*—
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Shogo, Iizuka; Mitsuo, Endo; Mitsugu, Watanabe; Toshio, Iizuka; and Kenji, Usui, 4,114,014, Cl. 219-56.000.
Mitsuhashi, Kenhachi: *See*—
Itoh, Hiroyuki; Mitsuhashi, Kenhachi; and Akashi, Hiromitsu, 4,112,746, Cl. 73-95.000.
Mitsuo, Endo: *See*—
Shogo, Iizuka; Mitsuo, Endo; Mitsugu, Watanabe; Toshio, Iizuka; and Kenji, Usui, 4,114,014, Cl. 219-56.000.
Mittag, Douglas C., to Aurora Equipment Company. Pallet rack and post protector assembly. 4,113,110, Cl. 211-191.000.
Mitter, Mathias. Method of printing webs. 4,112,531, Cl. 8-149.000.
Miyachi, Isao: *See*—
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, 4,113,568, Cl. 195-68.000.
Miyagi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. System for introducing secondary air into an internal combustion engine. 4,112,678, Cl. 60-276.000.
Miyahara, Kingo, to Dowa Co., Ltd. Gasified liquid fuel burner. 4,113,421, Cl. 431-122.000.
Miyakita, Hiroshi, to Miyakita, Ichiro. Rotary cutter drive control with electric motor. 4,114,079, Cl. 318-601.000.
Miyakita, Ichiro: *See*—
Miyakita, Hiroshi, 4,114,079, Cl. 318-601.000.
Miyasugi, Takeshi: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, 4,113,441, Cl. 422-197.000.
Miyazaki, Nobumasa: *See*—
Kagiyama, Yasuo; and Miyazaki, Nobumasa, 4,113,174, Cl. 236-12.00A.
Mizuguchi, Ryuzo: *See*—
Nagata, Nobuyoshi; and Mizuguchi, Ryuzo, 4,113,682, Cl. 260-29.4UA.
Mizuno, Michitaka; Ideue, Kazuo; and Oya, Masashi, to Mitsubishi Jukogyo Kabushiki Kaisha. Device for detecting the surface level of molten metal in a mold. 4,112,759, Cl. 73-295.000.
Mizutani, Koichi: *See*—
Takimoto, Masatami; and Mizutani, Koichi, 4,112,898, Cl. 123-136.000.
Mo Och Domsjo Aktiebolag: *See*—
Samuelson, Hans Olof, 4,113,553, Cl. 162-34.000.
Mobil Oil Corporation: *See*—
Kaeding, Warren W.; and Young, Lewis Brewster, 4,113,788, Cl. 260-673.000.
Nnadi, John C.; and Heilweil, Israel J., 4,113,725, Cl. 544-296.000.
Stournas, Stamoulis; and Heiba, El Ahmadi I., 4,113,632, Cl. 252-8.55D.
Mobile Aerial Towers, Inc.: *See*—
Myers, Lester L., 4,113,054, Cl. 182-2.000.
Moczygemba, George A., to Phillips Petroleum Company. Hydrogenated 1,3-cyclohexadiene/1,3-butadiene copolymers. 4,113,930, Cl. 526-25.000.
Modell, Michael; Reid, Robert C.; and Amin, Sanjay I., to Massachusetts Institute of Technology. Gasification process. 4,113,446, Cl. 48-202.000.
Modena, Mario; Massardo, Pietro; and Castelnuovo, Lucio, to Montedison S.p.A. Halogenated esters of polycarboxylic acids and plasticizers for chloro-vinyl polymers based on said esters. 4,113,689, Cl. 260-31.8HA.
Moen, George E.; and De Vito, Vincent P. Microwave furnace. 4,114,012, Cl. 219-10.55R.
Moen, Lowell J.: *See*—
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., 4,113,920, Cl. 428-565.000.
Moertel, George B., to Textron Inc. Slide fastener. 4,112,555, Cl. 24-205.13C.
Moffatt, Clinton D. Golf practice device. 4,113,257, Cl. 273-185.00C.
Mohacsi, Ernest, to Hoffmann-La Roche Inc. 3-Phenoxymorphinans and derivatives thereof. 4,113,729, Cl. 260-285.000.
Mohrmann, Karl Heinz: *See*—
Bauch, Helmut; Mohrmann, Karl Heinz; and Koppehele, Frithjof, 4,114,107, Cl. 330-56.000.
Mojonnier Bros. Co.: *See*—
Mojonnier, Harry G.; and Skoli, Sigmund P., 4,112,828, Cl. 99-275.000.
Mojonnier, Harry G.; and Skoli, Sigmund P., to Mojonnier Bros. Co. Reflux deaeration system. 4,112,828, Cl. 99-275.000.
Moles, Jacques Claude Antoine: *See*—
Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, 4,113,596, Cl. 204-180.00R.
Molins Limited: *See*—
Harrington, Timothy Cardell; and Arthur, Hugh MacDonald, 4,113,197, Cl. 242-58.100.
Preston, Edward George; and Doerman, Eryk Stefan, 4,112,954, Cl. 131-21.00R.
Moller, Eike; Meng, Karl, deceased (by Meng, Ilse Heide Frieda, heiress); Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, to Baker Aktiengesellshaft. 4-Substituted pyrazoles. 4,113,872, Cl. 424-273.00P.
Moller, Eike; Meng, Karl-August, deceased (by Meng, Ilse Heide Frieda, heir); Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, to Bayer Aktiengesellschaft. 1-Substituted pyrazoles. 4,113,957, Cl. 548-377.000.
Moller, Paul S., to Discojet Corporation. Engine muffler and spark arrester. 4,113,051, Cl. 181-231.000.
Moller, Siegfried: *See*—
Rones, Josef; Moller, Siegfried; and Hoch, Helmut, 4,113,498, Cl. 106-14.130.
Mongiello, Angelo. Cheese processing system. 4,112,835, Cl. 99-455.000.
Monroe Auto Equipment Company: *See*—
Palmer, Dale A., 4,113,072, Cl. 188-282.000.
Monsanto Company: *See*—
Chapman, Richard D.; Holmer, Donald A.; and Mortimer, George A., 4,113,708, Cl. 528-313.000.
Culbertson, Harry M., 4,113,700, Cl. 528-138.000.
MacLean, Donald L.; and Estes, Robert T., 4,113,704, Cl. 528-289.000.
Moran, James R., 4,113,798, Cl. 260-876.00R.
Schumacher, Ignatius; and White, James E., 4,113,574, Cl. 203-8.000.
Monsanto Company, St. Louis, Missouri: *See*—
Spiller, Herbert A., 4,112,668, Cl. 57-157.00S.
Montecatini Edison S.p.A.: *See*—
Mayr, Adolfo; Davoli, Velmore; Leccese, Antonio; and Susa, Ermanno, 4,113,654, Cl. 252-429.00C.
Montedison S.p.A.: *See*—
Alneri, Enzo; Bottaccio, Giorgio; Campolmi, Stefano; and Cassar, Luigi, 4,113,973, Cl. 568-716.000.
Matteoli, Mario; and Luciani, Luciano, 4,113,802, Cl. 260-878.00B.
Modena, Mario; Massardo, Pietro; and Castelnuovo, Lucio, 4,113,689, Cl. 260-31.8HA.
Padovan, Mario; De Alberti, Giordano; Battiston, Giancarlo; and Covini, Romano, 4,113,769, Cl. 562-534.000.
Moon, Malcolm W.; and Kornis, Gabriel, to Upjohn Company, The. Furyl pyrazole amides. 4,113,955, Cl. 548-374.000.

Moon, Malcolm W.; and Kornis, Gabriel, to Upjohn Company, The. Thienyl pyrazole amides. 4,113,956, Cl. 548-374.000.

Moore Business Forms, Inc.: *See—*
Halse, Per Weien, 4,113,281, Cl. 282-11.50A.

Moran, James R., to Monsanto Company. Transparent ABS polyblends. 4,113,798, Cl. 260-876.00R.

Morcom, Paul J. Plastic collapsible article carrier. 4,113,087, Cl. 206-174.000.

Morgan, James E., to Morgan Schaffer Corporation. Transformer fault detection. 4,112,737, Cl. 73-23.000.

Morgan Schaffer Corporation: *See—*
Morgan, James E., 4,112,737, Cl. 73-23.000.

Morgan, William H., Jr.: *See—*
Bonazoli, Robert P.; and Morgan, William H., Jr., 4,113,420, Cl. 431-93.000.

Morgenstern, Manfred: *See—*
Spengler, Hans; Bucksch, Gunter; and Morgenstern, Manfred, 4,113,931, Cl. 526-64.000.

Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, to Kuraray Co., Ltd. Process for preparation of substituted cyclopropane carboxylic acids and esters thereof and intermediates of said acids and esters. 4,113,968, Cl. 560-124.000.

Mori, Fumio: *See—*
Hotta, Hisashi; and Mori, Fumio, 4,113,539, Cl. 156-306.000.

Mori, Kouichi: *See—*
Iwata, Toshiharu; Hattori, Tadashi; Mori, Kouichi; and Akiyama, Tomojiro, 4,112,885, Cl. 123-98.000.

Mori, Mamoru: *See—*
Arai, Hiroshi; and Mori, Mamoru, 4,113,280, Cl. 280-747.000.

Mori, Shigeo; and Fujita, Takeshi, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Flame resistant polyurethane foam and process for producing the same. 4,113,667, Cl. 521-163.000.

Mori, Toshio: *See—*
Kojimoto, Susumu; Sato, Takami; and Mori, Toshio, 4,113,814, Cl. 264-89.000.

Morihashi, Toshihumi, to Murata Kikai Kabushiki Kaisha. Spinning apparatus for spun yarn. 4,112,658, Cl. 57-51.000.

Morikawa, Michio: *See—*
Hayashi, Torahiko; Kageyama, Minoru; and Morikawa, Michio, 4,113,819, Cl. 264-173.000.

Morozumi, Shinji, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece. 4,112,670, Cl. 58-23.00A.

Morsani, Rosemary; and Nelson, Edwin G. Grow-pot. 4,112,619, Cl. 47-66.000.

Mortimer, George A.: *See—*
Chapman, Richard D.; Holmer, Donald A.; and Mortimer, George A., 4,113,708, Cl. 528-313.000.

Morton-Norwich Products. Inc.: *See—*
Schwan, Thomas J., 4,113,743, Cl. 260-345.500.

Mosch, Franz: *See—*
Deiner, Hans; Mosch, Franz; and Bernheim, Willy, 4,113,947, Cl. 544-196.000.

Moses, John A. Laryngoscope of the straight blade type. 4,112,933, Cl. 128-11.000.

Mosler Safe Company, The: *See—*
Slater, Charles E.; Dunn, Paul E.; and Mustain, Lewis B., 4,114,027, Cl. 235-419.000.

Mossner, Elmer H.: *See—*
Langhorst, Martin A.; Sinke, Gerard C.; and Mossner, Elmer H., 4,113,471, Cl. 75-101.00R.

Mostert, Johann: *See—*
Greven, Johann; and Mostert, Johann, 4,112,730, Cl. 72-290.000.

Motoki, Jinro: *See—*
Kato, Yoshiaki; and Motoki, Jinro, 4,112,671, Cl. 58-23.00D.

Motorola, Inc.: *See—*
Brewster, Franklin Crawford, 4,113,326, Cl. 308-26.000.
Derdzinski, Terrence Edmund; and Karlin, James Hilliard, 4,113,331, Cl. 312-198.000.
Duncan, Herbert Alan, 4,114,105, Cl. 325-480.000.
Feder, Alvin, 4,114,000, Cl. 200-16.00R.
Schafft, Hugo Willy, 4,113,352, Cl. 350-150.000.

Motte, Raymond: *See—*
Casalis, Jean-Arnaud; Teil, Yves; and Motte, Raymond, 4,113,624, Cl. 210-219.000.

Mould, Henry Manifold: *See—*
Ford, Michael Alan; Mould, Henry Manifold; and Kolb, Dieter, 4,113,385, Cl. 356-96.000.

Mowery, Richard A., Jr., to Phillips Petroleum Company. Step-wise gradient carrier for liquid chromatography. 4,112,743, Cl. 73-61.10C.

Moye, Helen Ione. Method of forming an animal-figure decoration. 4,112,573, Cl. 29-428.000.

Mucke, Rainer: *See—*
Andrascheck, Hans-Joachim; and Mucke, Rainer, 4,113,679, Cl. 260-28.50D.

Mueller, David Charles, to American Can Company. Score line configuration for ice cream cartons and the like. 4,113,102, Cl. 206-611.000.

Mueller, Loren H. Agricultural sorting and packing apparatus. 4,113,610, Cl. 209-705.000.

Mueller, Robert C.: *See—*
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., 4,113,920, Cl. 428-565.000.

Mueller-Tamm, Heinz: *See—*
Schweier, Gunther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, 4,113,933, Cl. 526-124.000.

Muhlegg, Kurt, to Heberlein Maschinenfabrik AG. Friction false-twist device. 4,112,664, Cl. 57-77.400.

Muir, David Michael: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 4,113,848, Cl. 423-512.00A.

Mukaemachi, Takuji; Takeshita, Tetsuo; and Enami, Shiroh, to Hitachi, Ltd. Speech path packaging unit including controller containing shift register. 4,113,988, Cl. 179-18.0ES.

Mukai, Kiyohisa: *See—*
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, 4,113,441, Cl. 422-197.000.

Mukai, Kunio: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, 4,113,864, Cl. 424-225.000.

Mulaskey, Bernard F., to Chevron Research Company. Method of removing sulfur-containing impurities from hydrocarbons. 4,113,606, Cl. 208-244.000.

Muller, Franz, to August Lepper, Maschinen- und Apparatebau GmbH. Combined drum washer and drying arrangement. 4,112,590, Cl. 34-75.000.

Muller, Friedhelm: *See—*
Sackmann, Gunter; Hendricks, Udo-Winfried; Honig, Hans-Ludwig; Kolb, Gunter; and Muller, Friedhelm, 4,113,506, Cl. 106-238.000.

Muller, Hans; and Hanke, Georg, to Volkswagenwerk Aktiengesellschaft. Stay. 4,113,071, Cl. 188-282.000.

Muller, Herbert: *See—*
Huber, Leonhard; Kirschner, Helmut; and Muller, Herbert, 4,114,175, Cl. 354-252.000.

Muller, Johann, to Albert Handtmann, Firma. Method of and apparatus for making link sausages. 4,112,546, Cl. 17-49.000.

Muller, Lothar: *See—*
Raasch, Hans; and Muller, Lothar, 4,113,193, Cl. 242-18.00R.

Muller, Wolf-Rudiger: *See—*
Sekoulov, Ivan; and Muller, Wolf-Rudiger, 4,113,612, Cl. 210-17.000.
Sekoulov, Ivan; and Muller, Wolf-Rudiger, 4,113,613, Cl. 210-17.000.

Mullin, Therese A.: *See—*
Andrews, Jeffrey F.; Mullin, Therese A.; and Senkus, Raymond, 4,113,854, Cl. 424-81.000.

Mullins, Max. Compatible gear system. 4,112,782, Cl. 74-462.000.

Mullritter, Ludwig: *See—*
Eppe, Rudolf; Schnall, Gunther; Mullritter, Ludwig; Beck, Johann; and Hartwig, Karl, 4,113,373, Cl. 355-8.000.

Mumford, Richard G.: *See—*
Hanway, John E., Jr.; and Mumford, Richard G., 4,113,840, Cl. 423-242.000.

Muntjanoff, John R., to Caterpillar Tractor Co. Movable arch structure for skidder vehicle. 4,113,124, Cl. 214-147.00G.

Murakami, Kazuyoshi: *See—*
Kawabe, Takamasa; Kadoma, Masaaki; Murakami, Kazuyoshi; and Itoh, Hatuhide, 4,113,746, Cl. 260-348.220.

Murakami, Masuo: *See—*
Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, 4,113,882, Cl. 424-317.000.

Murakami, Ryoichi: *See—*
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, 4,113,519, Cl. 148-6.15R.

Murakami, Sakae, to Nippon Hoist Co., Ltd. Hook device. 4,112,750, Cl. 73-141.0AB.

Muramori, Kiyoshi: *See—*
Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, 4,113,608, Cl. 209-1.000.

Murashige, Masayuki: *See—*
Sekihara, Takeshi; Emura, Tomoyuki; and Murashige, Masayuki, 4,113,932, Cl. 526-74.000.

Murata, Hikaru, to Kayabakogyokabushikikaisha. Pressure responsive sequencing device. 4,112,822, Cl. 91-29.000.

Murata, Hikaru, to Kayabakogyokabushikikaisha. Pressure-reducing device. 4,112,825, Cl. 91-447.000.

Murata Kikai Kabushiki Kaisha: *See—*
Morihashi, Toshihumi, 4,112,658, Cl. 57-51.000.

Murata Manufacturing Co., Ltd.: *See—*
Nakatsu, Yoshiyuki; and Nishizawa, Hideo, 4,114,131, Cl. 338-162.000.

Murata, Tomoji; and Shibazaki, Kenji, to Minolta Camera Kabushiki Kaisha. Power regulating device for controlling exposing means and fixing means in electrophotographic copying apparatus. 4,113,375, Cl. 355-14.000.

Murata, Tomoji: *See—*
Nakamura, Yoshihiro; Shibazaki, Kenji; Kono, Tateomi; Inagaki, Syotaro; and Murata, Tomoji, 4,113,374, Cl. 355-14.000.

Murphy, Edward J.: *See—*
Rabi, Rafat T.; Murphy, Edward J.; and Basoms, John A., 4,113,597, Cl. 204-181.00C.

Musikindustriell Forskning MIFO AB: *See*—
Sjostrand, Gunnar; and Sjostrand, Staffan, 4,112,809, Cl. 84-465.000.
Musil, Josef: *See*—
Linkies, Adolf; Reuschling, Dieter-Bernd; Kuhlein, Klaus; Beck, Gerhard; and Musil, Josef, 4,113,874, Cl. 424-274.000.
Muskus, Meryl L., to Raymond Lee Organization, Inc., The, a part interest. Method of making a cord hammock. 4,112,816, Cl. 87-12.000.
Mustain, Lewis B.: *See*—
Slater, Charles E.; Dunn, Paul E.; and Mustain, Lewis B., 4,114,027, Cl. 235-419.000.
Muthenthaller, Gustav, to Kores S.p.A. Stapler. 4,113,164, Cl. 227-124.000.
Mutt, Viktor: *See*—
Said, Sami I.; and Mutt, Viktor, 4,113,711, Cl. 260-112.00R.
Myers, Lester L., to Mobile Aerial Towers, Inc. Fluid control system for mobile aerial towers. 4,113,054, Cl. 182-2.000.
Nagaoka, Kazuya: *See*—
Matsuura, Ryo; Nakatani, Shuichi; Nagaoka, Kazuya; and Hioki, Katsuhiko, 4,113,749, Cl. 260-351.000.
Nagaoka, Masaaki: *See*—
Komiyama, Yoshiro; Kondo, Katsumi; Koyama, Mototsugu; Nagaoka, Masaaki; and Uchida, Tsuneo, 4,113,167, Cl. 228-176.000.
Nagashima, Hideo: *See*—
Suzuki, Hiroshige; Horie, Eizi; and Nagashima, Hideo, 4,112,648, Cl. 52-508.000.
Nagata, Nobuyoshi; and Mizuguchi, Ryuzo, to Nippon Paint Co., Ltd. Coating composition containing resin having tertiary aliphatic group and reactive hydroxyl group, process for its preparation and article coated with the composition. 4,113,682, Cl. 260-29.4UA.
Nagy, Sandor: *See*—
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, 4,113,287, Cl. 285-137.00R.
Nakada, Tetsuro; Shimizu, Makoto; and Yoshinaga, Mayumi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Sumitomo Metal Industries, Ltd. Apparatus for cooling slag. 4,113,239, Cl. 266-137.000.
Nakagawa, Jihei, to Olympus Optical Co., Ltd. Retrofocus type wide-angle photographic lens system. 4,113,358, Cl. 350-216.000.
Nakagawa, Tadashi: *See*—
Onda, Eiichi; Watanabe, Masanori; Nakagawa, Tadashi; Nemoto, Ichiro; and Koyama, Mitsuo, 4,114,174, Cl. 354-249.000.
Nakaguti, Osamu: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,113,940, Cl. 544-16.000.
Nakaji, Hideki: *See*—
Okunishi, Hiromu; Nakaji, Hideki; Suwa, Hiroyuki; and Sato, Hideaki, 4,112,732, Cl. 72-334.000.
Nakajima, Yoshikage: *See*—
Igarashi, Toshiji; and Nakajima, Yoshikage, 4,113,870, Cl. 424-266.000.
Nakamura, Kantaro: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, 4,113,441, Cl. 422-197.000.
Nakamura, Soichi, to Nippon Kogaku K. K. Telephoto lens system. 4,113,357, Cl. 350-212.000.
Nakamura, Yoshihiro; Shibazaki, Kenji; Kono, Tateomi; Inagaki, Syotaro; and Murata, Tomoji, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus. 4,113,374, Cl. 355-14.000.
Nakanishi, Atsuo: *See*—
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, 4,113,795, Cl. 260-874.000.
Nakano, Harumi, to Casio Computer Co., Ltd. Liquid crystal display device. 4,113,361, Cl. 350-332.000.
Nakaoka, Azuma: *See*—
Koseki, Yasuo; Takahashi, Sankichi; and Nakaoka, Azuma, 4,113,618, Cl. 210-82.000.
Nakaoka, Kazuhide; Araki, Kenzi; Nishimoto, Akihiko; Iwase, Kozi; and Kubotera, Haruo, to Nippon Kokan Kabushiki Kaisha. Method of making cold-reduced Al-killed steel strip for press-forming by continuous casting and continuous annealing process. 4,113,517, Cl. 148-2.000.
Nakashima, Toshihiko: *See*—
Teranishi, Takanori; and Nakashima, Toshihiko, 4,114,076, Cl. 318-421.000.
Nakatani, Shuichi: *See*—
Matsuura, Ryo; Nakatani, Shuichi; Nagaoka, Kazuya; and Hioki, Katsuhiko, 4,113,749, Cl. 260-351.000.
Nakatsu, Yoshiyuki; and Nishizawa, Hideo, to Murata Manufacturing Co., Ltd. Variable resistor. 4,114,131, Cl. 338-162.000.
Nakazato, Masao: *See*—
Yoneda, Kenji; Nakazato, Masao; and Yuminaka, Takeo, 4,113,066, Cl. 187-29.00R.
Nanthavong, Souli: *See*—
Pigerol, Charles; de Cointet de Fillain, Paul; and Nanthavong, Souli, 4,113,736, Cl. 260-326.160.
Narita, Hirosi: *See*—
Uchida, Kuniki; Araki, Kenzi; Narita, Hirosi; Fukunaka, Shiro; and Kurihara, Takao, 4,113,523, Cl. 148-12.300.
Naslund, Rolf Paul: *See*—
Margen, Peter Heinrich Erwin; and Naslund, Rolf Paul, 4,112,569, Cl. 29-157.30R.
National Fluoride and Chemical Corporation: *See*—
Orth, George Otto, Jr.; and Orth, Richard D., 4,113,831, Cl. 423-119.000.
National Gypsum Company: *See*—
O'Connor, Francis J., 4,113,836, Cl. 423-171.000.
National Research Development Corporation: *See*—
Barlow, Harold Everard Monteagle, 4,114,121, Cl. 333-95.00R.
Carter, Michael Charles; and Steer, Philip James, 4,114,188, Cl. 364-415.000.
Gates, John William Charles; Hall, Roy Geoffrey Noel; Ross, Ian Norman; and Stevens, Richard Frederick, 4,113,388, Cl. 356-110.000.
National Semiconductor Corporation: *See*—
Ross, John P.; and Bernardi, Carl E., 4,113,577, Cl. 204-15.000.
National Starch and Chemical Corporation: *See*—
Pastor, Stephen D.; and Grover, Martin M., 4,113,792, Cl. 260-834.000.
National Steel Corporation: *See*—
Manda, John G.; Burroughs, Joe D.; and Cairns, Donald F., 4,113,572, Cl. 202-227.000.
Naylor Brothers (Clayware) Limited: *See*—
Widdicombe, Derek Gordon, 4,112,979, Cl. 138-89.000.
Nees, John; and Pike, Kenneth, to General Battery Corporation. Method of treating low antimony alloy battery grid material with phosphorus. 4,113,476, Cl. 75-166.00C.
Nees, John; and Pike, Kenneth, to General Battery Corporation. Method of treating low antimony alloy battery grid material with phosphorus. 4,113,477, Cl. 75-166.00C.
Negishi, Masaaki: *See*—
Watanabe, Haruo; and Negishi, Masaaki, 4,113,752, Cl. 260-424.000.
Nehring, John R., to International Paper Company. Combined irrigator and evacuator for closed wounds. 4,112,947, Cl. 128-278.000.
Neidell, Norman S. Echo location systems. 4,114,153, Cl. 343-9.000.
Neinast, Gary S., to Suntech, Inc. Pulling tool apparatus. 4,113,236, Cl. 254-134.500.
Nelkin, Arthur; Skinner, Dale D.; Wilson, Donald G.; and Palmer, Harold D., to Westinghouse Electric Corp. Piezoelectric sediment particle transport detector. 4,114,063, Cl. 310-334.000.
Nelson, Christian E. Barge-supported crane with hydraulically actuated ram corner lift means. 4,112,863, Cl. 114-264.000.
Nelson, Edwin G.: *See*—
Morsani, Rosemary; and Nelson, Edwin G., 4,112,619, Cl. 47-66.000.
Nelson, Karl L. Fastener holding attachment for a tool. 4,112,988, Cl. 145-50.00D.
Nelson, Larry L.: *See*—
DeHart, John R.; Nelson, Larry L.; and Krehl, William H., 4,113,105, Cl. 209-549.000.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-ω-phenoxy-PGE analogs. 4,113,778, Cl. 260-590.00C.
Nemoto, Ichiro: *See*—
Onda, Eiichi; Watanabe, Masanori; Nakagawa, Tadashi; Nemoto, Ichiro; and Koyama, Mitsuo, 4,114,174, Cl. 354-249.000.
Neste Oy: *See*—
Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Koutroulos, Jean, 4,113,483, Cl. 96-1.0PC.
New Concepts, Inc.: *See*—
Still, Robert C., 4,112,969, Cl. 137-454.200.
New Rochelle Manufacturing Co., Inc.: *See*—
Newman, Philip, 4,112,871, Cl. 119-18.000.
Newman, Philip, to New Rochelle Manufacturing Co., Inc. Bird cage feeder. 4,112,871, Cl. 119-18.000.
NHK Spring Co., Ltd.: *See*—
Takase, Hirobumi; and Utsunomiya, Yutaka, 4,112,721, Cl. 72-12.000.
Nicola, Charles: *See*—
Dayet, Jacques; Martin, Joseph; and Nicola, Charles, 4,114,004, Cl. 200-148.00A.
Niederst, Kenneth W., to PPG Industries, Inc. Aqueous dispersions of esters stabilized with carbodiimides. 4,113,676, Cl. 260-22.00T.
Niemann, Heinz, to ESGE-MARBY GmbH & Co. Luggage carrier for two-wheel vehicles, such as bicycles. 4,113,158, Cl. 224-39.000.
Nifco Inc.: *See*—
Tanaka, Toshie, 4,112,815, Cl. 85-80.000.
Nikko Co., Ltd.: *See*—
Ishimoto, Zenichi, 4,112,615, Cl. 46-254.000.
Nikly, Jean, to Automobiles M. Berliet. Method and device for ensuring the tightness of a cylinderhead on the cylinder block of a thermal engine, in particular, a diesel engine. 4,112,907, Cl. 123-193.0CH.
Niksa, Gregory J.: *See*—
Rosenthal, Isadore; Exner, Lawrence J.; Niksa, Gregory J.; Weiss, Warren I.; and Young, Maurice G., 4,112,714, Cl. 68-206.000.
Nilson, Billy N., to KeNova AB. Safety valve. 4,112,971, Cl. 137-508.000.
Nimura, Takayasu, to Nippondenso Co., Ltd. Rotor for alternating current generator. 4,114,056, Cl. 310-42.000.
Nippon Cable Systems Inc.: *See*—
Fukuda, Mataharu, 4,112,708, Cl. 64-2.00R.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Iyeta, Motoi, 4,113,265, Cl. 274-23.00R.

Nippon Hoist Co., Ltd.: *See—*
Murakami, Sakae, 4,112,750, Cl. 73-141.0AB.
Nippon Hume Pipe Company Limited: *See—*
Iida, Hideo, 4,113,823, Cl. 264-228.000.
Nippon Kogaku K. K.: *See—*
Kakizaki, Yukio, 4,113,223, Cl. 248-430.000.
Nakamura, Soichi, 4,113,357, Cl. 350-212.000.
Nippon Kokan Kabushiki Kaisha: *See—*
Nakaoka, Kazuhide; Araki, Kenzi; Nishimoto, Akihiko; Iwase, Kozi; and Kubotera, Haruo, 4,113,517, Cl. 148-2.000.
Uchida, Kuniki; Araki, Kenzi; Narita, Hirosi; Fukunaka, Shiro; and Kurihara, Takao, 4,113,523, Cl. 148-12.300.
Nippon Oil Company Ltd.: *See—*
Shinomura, Toshihiko, 4,113,908, Cl. 428-113.000.
Nippon Paint Co., Ltd.: *See—*
Nagata, Nobuyoshi; and Mizuguchi, Ryuzo, 4,113,682, Cl. 260-29.4UA.
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, 4,113,519, Cl. 148-6.15R.
Nippon Soken, Inc.: *See—*
Iwata, Toshiharu; Hattori, Tadashi; Mori, Kouichi; and Akiyama, Tomojiro, 4,112,885, Cl. 123-98.000.
Nippon Steel Corporation: *See—*
Sakurai, Toshio; Shimada, Shoji; and Kamimura, Yoshiharu, 4,113,635, Cl. 252-49.600.
Nippon Telegraph and Telephone Public Corp.: *See—*
Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, 4,114,097, Cl. 325-320.000.
Nippon Zeon Co. Ltd.: *See—*
Akiyama, Shinichi; and Yamamoto, Haruhisa, 4,113,770, Cl. 562-532.000.
Nippondenso Co., Ltd.: *See—*
Akado, Hajime; Uchida, Yoshiro; Yamaguchi, Akihide; Nonoyama, Takao; Ootsubo, Suminobu; and Harada, Toshiro, 4,112,896, Cl. 123-122.00D.
Nimura, Takayasu, 4,114,056, Cl. 310-42.000.
Nojiri, Tadao; Sugiura, Akio; and Nomura, Masahiro, 4,114,030, Cl. 235-464.000.
Okamoto, Atutoshi; Nojiri, Tadao; and Nomura, Masahiro, 4,114,033, Cl. 235-494.000.
Teranishi, Takanori; and Nakashima, Toshihiko, 4,114,076, Cl. 318-421.000.
Uno, Eiichi; and Hachiga, Takasi, 4,112,904, Cl. 123-148.00E.
Nishida, Takashi: *See—*
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,113,968, Cl. 560-124.000.
Nishide, Hiroo; and Uehara, Yasuhiro, to Rank Xerox, Ltd. Heat roll fixing device for electrophotographic copying machine. 4,114,021, Cl. 219-216.000.
Nishikawa, Masaji: *See—*
Kimura, Katsuhiko; and Nishikawa, Masaji, 4,113,372, Cl. 355-3.0SC.
Nishimoto, Akihiko: *See—*
Nakaoka, Kazuhide; Araki, Kenzi; Nishimoto, Akihiko; Iwase, Kozi; and Kubotera, Haruo, 4,113,517, Cl. 148-2.000.
Nishimura, Sanji: *See—*
Watanabe, Morio; and Nishimura, Sanji, 4,113,588, Cl. 204-151.000.
Nishino, Atsushi: *See—*
Ookubo, Toshio; Nishino, Atsushi; and Suzuki, Tadashi, 4,113,439, Cl. 422-177.000.
Nishizawa, Hideo: *See—*
Nakatsu, Yoshiyuki; and Nishizawa, Hideo, 4,114,131, Cl. 338-162.000.
Nissan Motor Company, Limited: *See—*
Anzai, Makoto, 4,112,893, Cl. 123-119.0EC.
Asano, Masaharu; and Kadowaki, Shunichi, 4,112,880, Cl. 123-32.0EE.
Niwa, Takao: *See—*
Goto, Kenji; and Niwa, Takao, 4,112,877, Cl. 123-32.0ST.
Nnadi, John C.; and Heilweil, Israel J., to Mobil Oil Corporation. Multifunctional additives. 4,113,725, Cl. 544-296.000.
Noack, Rolf; Schuster, Joachim; and Lohse, Udo, to Deutsche Babcock Aktiengesellschaft. Device for bending pipes. 4,112,728, Cl. 72-154.000.
Nogita, Shunsuke: *See—*
Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, 4,113,608, Cl. 209-1.000.
Noguchi, Katsuyuki: *See—*
Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, 4,113,873, Cl. 424-274.000.
Nohira, Hidetaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for recirculating exhaust gases. 4,112,894, Cl. 123-119.00A.
Nojiri, Shoji; Kanzaki, Hisao; Yasoshima, Nobuyuki; Satake, Yasuo; and Ogawa, Kenichi, to Fujitsu Limited. Signal sending control system. 4,113,990, Cl. 179-84.00R.
Nojiri, Tadao; Sugiura, Akio; and Nomura, Masahiro, to Nippondenso Co., Ltd. Method and apparatus to optically recognize recorded information. 4,114,030, Cl. 235-464.000.
Nojiri, Tadao: *See—*
Okamoto, Atutoshi; Nojiri, Tadao; and Nomura, Masahiro, 4,114,033, Cl. 235-494.000.
Nolan, John T., Jr.: *See—*
Rao, Babu Y.; Nolan, John T., Jr.; and Estes, John H., 4,113,789, Cl. 260-683.680.
Noll, Klaus-Reinhold: *See—*
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,113,777, Cl. 260-570.900.
Nomaki, Koji; and Saoyama, Yoshihito, to Asahi Glass Company, Ltd. Soldering apparatus. 4,112,868, Cl. 118-429.000.
Nomura, Masahiro: *See—*
Nojiri, Tadao; Sugiura, Akio; and Nomura, Masahiro, 4,114,030, Cl. 235-464.000.
Okamoto, Atutoshi; Nojiri, Tadao; and Nomura, Masahiro, 4,114,033, Cl. 235-494.000.
Nonoyama, Takao: *See—*
Akado, Hajime; Uchida, Yoshiro; Yamaguchi, Akihide; Nonoyama, Takao; Ootsubo, Suminobu; and Harada, Toshiro, 4,112,896, Cl. 123-122.00D.
Noo, Kunio: *See—*
Matsui, Takashi; Sugimura, Sadao; and Noo, Kunio, 4,113,824, Cl. 264-230.000.
Nordica International, Inc.: *See—*
Conger, William H.; and Gehringer, Ronald F., 4,112,820, Cl. 70-363.000.
Nordin, Soren B.: *See—*
Nyren, Jan O.; Nordin, Soren B.; and Flodman, Leif A., 4,113,555, Cl. 162-127.000.
Nordiska Maskinfilt Aktiebolaget: *See—*
Bugge, Hans Jorgen; Strandly, Ingvald; and Swanberg, Carl Olof, 4,112,982, Cl. 139-425.00A.
Norfield Corporation: *See—*
Beasley, Donald R., 4,113,909, Cl. 428-116.000.
Norian, Roger F.: *See—*
Gorham, Michael L.; and Norian, Roger F., 4,113,991, Cl. 179-90.00B.
Norris, Alan H.; and Chambley, Phillip W., to Champion International Corporation. Apparatus for manufacturing filaments of varying denier and actuating means therefor. 4,112,561, Cl. 28-243.000.
Nortec Inc.: *See—*
Sherwin, William Claude, 4,113,275, Cl. 280-615.000.
North, Bernard: *See—*
Lumby, Roland John; North, Bernard; and Taylor, Alfred James, 4,113,503, Cl. 106-73.400.
Northern Telecom Limited: *See—*
Pound, Thomas Charles; and Gouldson, Eric John, 4,113,534, Cl. 156-56.000.
Westwood, William Dickson, 4,114,037, Cl. 250-216.000.
Northwestern University: *See—*
Epstein, Max; Marhic, Michel E.; and Schacham, Samuel E., 4,114,112, Cl. 331-94.50C.
Norton, Richard V., to Suntech, Inc. Process for cyanohydrin esters. 4,113,763, Cl. 260-465.00D.
Nortronics Company, Inc.: *See—*
Kronfeld, Mervin B., 4,113,141, Cl. 221-70.000.
Nosaka, Yoshinori: *See—*
Fukushima, Keitaro; Kusunose, Takamaro; and Nosaka, Yoshinori, 4,113,847, Cl. 423-447.400.
Nosker, Richard William, to RCA Corporation. Smooth groove formation method employing spin coating of negative replica of inscribed disc. 4,113,897, Cl. 427-140.000.
Nossen, Edward J., to United States of America, Army. Frequency synthesizer. 4,114,110, Cl. 331-2.000.
Numair, Solomon J.: *See—*
Lonstrup, Thorkild F.; Brownawell, Darrell W.; Goletz, Edward, Jr.; and Numair, Solomon J., 4,113,639, Cl. 252-51.50A.
Nyberg, David Dolph, to Raychem Corporation. Poly(tetramethyleneterephthalate) crosslinked by irradiation. 4,113,594, Cl. 204-159.150.
Nygards, Nils. Water distiller of boiler-condenser type. 4,113,571, Cl. 202-176.000.
Nyren, Jan O.; Nordin, Soren B.; and Flodman, Leif A., to Svenska Traforskningsinstitutet. Hard board or medium density board, process for production thereof and means for practicizing the process. 4,113,555, Cl. 162-127.000.
O.P.O. Giken Kabushiki Kaisha: *See—*
Komatsu, Saburo, 4,114,125, Cl. 335-258.000.
Oak Industries, Incorporated: *See—*
Desiderio, Angelo C., 4,114,007, Cl. 200-246.000.
Oates, Robert M.; and Mackenzie, Raymond W., to Westinghouse Electric Corp. Rotor overtemperature protection for electric motors. 4,114,077, Cl. 318-473.000.
Oberheiden, Helmut: *See—*
Huper, Fritz; and Oberheiden, Helmut, 4,113,941, Cl. 544-20.000.
Obinata, Shiro; Hashimoto, Shigeru; and Sahara, Takeshi, to Dowa Mining Co., Ltd. Process of tin flotation. 4,113,106, Cl. 209-167.000.
Oce-van der Grinten N.V.: *See—*
Extra, Piet M. J.; Smeets, Lambertus R. J. M.; Van Bavel, Adrianus W. M.; Van Lieshout, Jacobus J.; and Deckers, Albert T., 4,112,870, Cl. 118-657.000.
Ochii, Kiyofumi: *See—*
Suzuki, Yasoji; and Ochii, Kiyofumi, 4,114,192, Cl. 365-189.000.
Ockers, Gerhardus: *See—*
Hoff, Siebe; Ockers, Gerhardus; Buitelaar, Arnold A.; and Van De Kraats, Eduard J., 4,113,442, Cl. 44-66.000.
O'Connell, Joseph J., to Scientific Dimensions, Inc. Apparatus for

removably mounting equipment to a vehicle. 4,113,217, Cl. 248-221.300.

O'Connor, Francis J., to National Gypsum Company. Continuous gypsum calcination process and kettle therefor. 4,113,836, Cl. 423-171.000.

O'Connor, Michael Niall Desmond: *See—*
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,113,934, Cl. 526-258.000.

Oda, Lorraine K.: *See—*
Oda, Roy N.; and Oda, Lorraine K., 4,112,833, Cl. 99-425.000.

Oda, Roy N.; and Oda, Lorraine K. Microwave cooking device. 4,112,833, Cl. 99-425.000.

Oderbolz, Fredy; and Bebie, Paul, to Ruti Machinery Works Ltd. Picking bands and drive arrangement for gripper weaving machine. 4,112,983, Cl. 139-446.000.

Oelke, Waldemar W.: *See—*
Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., 4,113,162, Cl. 225-2.000.

Offermanns, Heribert: *See—*
Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, 4,113,773, Cl. 260-545.00R.

Ogawa, Kenichi: *See—*
Nojiri, Shoji; Kanzaki, Hisao; Yasoshima, Nobuyuki; Satake, Yasuo; and Ogawa, Kenichi, 4,113,990, Cl. 179-84.00R.

Ogawa, Taizo: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, 4,113,864, Cl. 424-225.000.

Ogisu, Kenji: *See—*
Tokumoto, Shin-Ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,113,581, Cl. 204-39.000.
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,113,582, Cl. 204-39.000.

Ohashi, Hiroshi: *See—*
Inoue, Hiromitsu; Ohashi, Hiroshi; and Katayama, Susumu, 4,114,146, Cl. 340-558.000.

Ohuchi, Kenji: *See—*
Itoh, Tsutomu; Furuya, Nobuo; and Ohuchi, Kenji, 4,112,869, Cl. 118-623.000.

Ohzeki, Toshio: *See—*
Minagawa, Motonobu; Ohzeki, Toshio; and Sekiguchi, Tetsuo, 4,113,678, Cl. 260-23.70M.

Oishi, Masaharu: *See—*
Kogure, Motoo; Komiya, Mamoru; Oishi, Masaharu; and Kanbe, Masaru, 4,113,918, Cl. 428-412.000.

Oka, Shohei: *See—*
Fuse, Takeshi; Yajima, Toshio; Hino, Isao; and Oka, Shohei, 4,113,216, Cl. 248-204.000.

Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, to Nippon Paint Co., Ltd. Phosphating of metallic substrate with electrolytic reduction of nitrate ions. 4,113,519, Cl. 148-6.15R.

Okabayashi, Keiichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing controller for a gasoline engine. 4,112,888, Cl. 123-117.00A.

Okamoto, Atutoshi; Nojiri, Tadao; and Nomura, Masahiro, to Nippondenso Co., Ltd. Bar code information card. 4,114,033, Cl. 235-494.000.

Okano, Masao, to Toyo Valve Company, Ltd. Copper alloys of excellent corrosion resistance, moldability and workability. 4,113,474, Cl. 75-156.500.

Okazaki, Hiroshi: *See—*
Okumura, Tomisaburo; Okazaki, Hiroshi; Tsuchitani, Akira; and Ueda, Seiji, 4,113,533, Cl. 148-187.000.

Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, to Yamanouchi Pharmaceutical Co., Ltd. Stabilized oral prostaglandin formulation and the process for the preparation thereof. 4,113,882, Cl. 424-317.000.

Oki Electric Industry Co., Ltd.: *See—*
Isobe, Minoru, 4,113,750, Cl. 206-388.000.

Okita, Koichi, to Sumitomo Electric Industries, Ltd. Hydrophilic porous structures and process for production thereof. 4,113,912, Cl. 428-290.000.

Oku, Teruo: *See—*
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,113,940, Cl. 544-16.000.

Okubo, Hiroyuki: *See—*
Yoshizawa, Isamu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,112,798, Cl. 83-344.000.

Okubo, Toshio: *See—*
Saiki, Atsushi; Okubo, Toshio; and Harada, Seiki, 4,113,550, Cl. 156-656.000.

Okuda, Hiroji; and Harada, Shigenori, to Koyo Seiko Company Limited. Drive shaft for rolling mills and the like. 4,112,710, Cl. 64-23.000.

Okumura, Tomisaburo; Okazaki, Hiroshi; Tsuchitani, Akira; and Ueda, Seiji, to Matsushita Electronics Corporation. Method of making a MOS device. 4,113,533, Cl. 148-187.000.

Okunishi, Hiromu; Nakaji, Hideki; Suwa, Hiroyuki; and Sato, Hideaki, to Honda Giken Kogyo Kabushiki Kaisha. Method and apparatus for shaping integrally-shaped type brake disks for cars. 4,112,732, Cl. 72-334.000.

Okuno, Yositosi: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, 4,113,864, Cl. 424-225.000.

Okutsu, Eiichi: *See—*
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, 4,113,489, Cl. 96-60.00R.

Olbrich, Gottfried; and Weigert, Wilhelm, to Robert Bosch GmbH. Valve for an opening of a pressure vessel. 4,112,978, Cl. 138-30.000.

Olin Corporation: *See—*
Turley, Richard J.; and Ozolins, Alexandre, 4,113,541, Cl. 156-330.000.

Oliver, Colin Charles, to EMI Limited. Radiography. 4,114,041, Cl. 250-445.00T.

Ollivier, Jean: *See—*
Combette, Marc; and Ollivier, Jean, 4,112,685, Cl. 60-634.000.
Combette, Marc; Dorgnon, Roger; Luthringer, Jean; and Ollivier, Jean, 4,113,163, Cl. 227-10.000.

Olmstead, John Aaron: *See—*
Ponczak, Samuel; and Olmstead, John Aaron, 4,113,516, Cl. 148-1.500.

Olmstead, William Dean, to Cycle-Kamp Inc. Compact tent-type camping trailer. 4,113,301, Cl. 296-23.00H.

Olsson, Erik A. Method of and apparatus for converting molten metal into solidified products. 4,113,166, Cl. 228-170.000.

Olympus Optical Co., Ltd.: *See—*
Kimura, Katsuhiko; and Nishikawa, Masaji, 4,113,372, Cl. 355-3.0SC.
Matsubara, Masaki, 4,113,356, Cl. 350-186.000.
Nakagawa, Jihei, 4,113,358, Cl. 350-216.000.
Yamasita, Nobuo; and Imai, Toshihiro, 4,113,354, Cl. 350-172.000.

Omura, Yoshiaki: *See—*
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 4,113,968, Cl. 560-124.000.

Onda, Eiichi; Watanabe, Masanori; Nakagawa, Tadashi; Nemoto, Ichiro; and Koyama, Mitsuo, to Seiko Koki Kabushiki Kaisha. Shutter opening and closing mechanism for cameras. 4,114,174, Cl. 354-249.000.

Ondetti, Miguel Angel; and Condon, Michael Edward, to E. R. Squibb & Sons, Inc. Amino acid derivatives. 4,113,715, Cl. 260-112.50R.

Onnen, William G.: *See—*
Hill, Robert W.; Onnen, William G.; and Ryder, Lyle C., 4,113,825, Cl. 264-262.000.

Onoda Cement Co., Ltd.: *See—*
Itoh, Tsutomu; Furuya, Nobuo; and Ohuchi, Kenji, 4,112,869, Cl. 118-623.000.

Ooishi, Tadashi: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, 4,113,864, Cl. 424-225.000.

Ookubo, Toshio; Nishino, Atsushi; and Suzuki, Tadashi, to Matsushita Electric Industrial Co., Ltd. Cooking apparatus employing a purging device. 4,113,439, Cl. 422-177.000.

Oomura, Takao: *See—*
Funakoshi, Satoshi; and Oomura, Takao, 4,113,853, Cl. 424-78.000.

Ootsubo, Suminobu: *See—*
Akado, Hajime; Uchida, Yoshiro; Yamaguchi, Akihide; Nonoyama, Takao; Ootsubo, Suminobu; and Harada, Toshiro, 4,112,896, Cl. 123-122.00D.

Opgenorth, Hans-Joachim; and Scheuermann, Horst, to BASF Aktiengesellschaft. Manufacture of benzothiazoles. 4,113,732, Cl. 260-305.000.

Opitz, Konrad: *See—*
Kruse, Hubert; and Opitz, Konrad, 4,113,429, Cl. 8-90.000.

Ore-Ida Foods, Inc.: *See—*
Covington, Wayne L.; and Green, Glen R., 4,112,545, Cl. 17-45.000.

Orrville Products, Inc.: *See—*
Featherstone, Harry Edwin; and Sniff, Walter Grant, Jr., 4,114,020, Cl. 219-137.00R.

Orth, Dieter: *See—*
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, 4,113,863, Cl. 424-205.000.

Orth, George Otto, Jr.; and Orth, Richard D., to National Fluoride and Chemical Corporation. Recovery of sodium fluoride and other chemicals from spent carbon liners. 4,113,831, Cl. 423-119.000.

Orth, Richard D.: *See—*
Orth, George Otto, Jr.; and Orth, Richard D., 4,113,831, Cl. 423-119.000.

Orzales, Henri-Ange, to Societe Civile de Recherches et d'Etudes Nouvelles. 3-(4'-Alkoxy-benzoyl)-1,2,2-trimethyl-cyclopentane-carboxylic acids, their optical isomers and drugs containing such compounds. 4,113,960, Cl. 560-52.000.

Osaka Prefectural Office: *See—*
Fuse, Takeshi; Yajima, Toshio; Hino, Isao; and Oka, Shohei, 4,113,216, Cl. 248-204.000.

Osaka Soda Co., Ltd.: *See—*
Kawabe, Takamasa; Kadoma, Masaaki; Murakami, Kazuyoshi; and Itoh, Hatuhide, 4,113,746, Cl. 260-348.220.

Osanai, Shinichi, to Labogiken Co., Ltd. Apparatus for withdrawing the tongue of a film incorporated in a cartridge. 4,113,192, Cl. 242-1.000.

Osawa, Mitsuo: *See—*
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, 4,113,264, Cl. 274-15.00R.

Oshima, Kathuhide; Takasaki, Haruyuki; and Takahashi, Akio, to

Dipsol Chemical Company, Ltd. Method for brightening the electrodeposits of zinc from alkaline zinc electroplating baths. 4,113,583, Cl. 204-55.00Y.

Oshio, Hiromichi; Konishi, Hiroyuki; Matsumura, Shiunzi; Ishikawa, Kikuichi; and Yoneyama, Eiichi, to Sumitomo Chemical Company, Limited. Method for controlling the growth of plants. 4,113,463, Cl. 71-76.000.

Osterburg, Gunther: *See—*
Strehlke, Gunter; and Osterburg, Gunther, 4,113,780, Cl. 260-593.00P.

Ostergaard, Steen. Dispenser for ground coffee and other powdered products. 4,113,150, Cl. 222-243.000.

O'Toole, Jerome M.; and Paquette, Edmund T., to Wright Line Inc. Holder for documentation cartridge. 4,113,330, Cl. 312-184.000.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See—*
Shimizu, Junichi; Hara, Takashi; Iwakura, Tatsuya; and Itaya, Yoshiro, 4,113,892, Cl. 426-602.000.

Otsuka Nutrition Research Institute Inc.: *See—*
Ando, Sumio, 4,113,410, Cl. 417-502.000.

Ott, Hans, to Meteor AG. Soldering apparatus. 4,113,165, Cl. 228-36.000.

Ott, Karl-Heinz: *See—*
Bischoff, Jurgen; Kowitz, Friedrich; Ott, Karl-Heinz; Schuster, Herbert; Rohr, Harry; and Weitzel, Hans, 4,113,796, Cl. 260-876.00R.

Ott, Robert B.; and Heringer, Lawrence R., to Hennegan Company, The. Display panel assembly. 4,112,604, Cl. 40-610.000.

Otto, Jeffrey B.: *See—*
McGarry, Francis J.; Greene, Donald; and Otto, Jeffrey B., 4,113,554, Cl. 162-123.000.

Otto, Wolfgang K. F., to Milliken Research Corporation. Method for modifying fibers of a fabric and the products so produced. 4,113,430, Cl. 8-115.500.

Otto, Wolfgang K. F., to Milliken Research Corporation. Method for modifying fibers of a fabric and the products so produced. 4,113,432, Cl. 8-125.000.

Oude Alink, Bernardus A., to Petrolite Corporation. Preparation of octahydrophenanthridines. 4,113,730, Cl. 260-286.00A.

Ouellette, Joseph Fernand; and Poeling, David L., to Quellette Machinery Systems, Inc. Earthquake simulator. 4,112,776, Cl. 73-665.000.

Outboard Marine Corporation: *See—*
Fields, Ernest E.; and Reineck, Lester W., 4,113,138, Cl. 220-367.000.
Hackbarth, Eugene R.; and Van Rens, Russell J., 4,113,808, Cl. 261-52.000.

Outokumpu Oy: *See—*
Aaltonen, Olavi August; and Juusela, Jyrki Tapani, 4,113,470, Cl. 75-74.000.

Outokumpu Oy, Ab.: *See—*
Leinonen, Erkki Ilmari; and Kiuru, Erkki Sakari, 4,114,085, Cl. 323-17.000.

Owen, Wickersham & Erickson: *See—*
Lindberg, John E., 4,112,892, Cl. 123-119.00A.

Owens-Corning Fiberglas Corporation: *See—*
Stalego, Charles J., 4,113,457, Cl. 65-11.00R.

Owens-Illinois, Inc.: *See—*
Ernsthausen, Roger E., 4,114,064, Cl. 313-188.000.

Oxford Industries, Inc.: *See—*
Ellington, Gordon H.; Mitchell, William O.; and Estapa, Don E., 4,112,860, Cl. 112-262.000.

Oxy Metal Industries Corporation: *See—*
Rones, Josef; Moller, Siegfried; and Hoch, Helmut, 4,113,498, Cl. 106-14.130.

Oy. Tampella AB: *See—*
Lehtinen, Jukka A., 4,112,586, Cl. 34-9.000.

Oya, Masashi: *See—*
Mizuno, Michitaka; Ideue, Kazuo; and Oya, Masashi, 4,112,759, Cl. 73-295.000.

Ozaki, Masaru: *See—*
Shiga, Tetsuo; Ozaki, Masaru; Arakawa, Tatsumi; and Kobayashi, Hidehiko, 4,113,496, Cl. 96-114.100.

Ozaki, Toshiaki: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, 4,113,864, Cl. 424-225.000.

Ozaki, Tsutomu; and Hijikata, Setsuo, to Kubota, Ltd. Body weight measuring apparatus. 4,113,039, Cl. 177-25.000.

Ozolins, Alexandre: *See—*
Turley, Richard J.; and Ozolins, Alexandre, 4,113,541, Cl. 156-330.000.

P. D. George Company, The: *See—*
Lange, Daniel J., 4,113,706, Cl. 528-289.000.

P. R. Mallory & Co. Inc.: *See—*
Klein, Gerhart P., 4,113,240, Cl. 266-252.000.

Pachnik, Ben E. Radius router guide. 4,112,987, Cl. 144-323.000.

Padovan, Mario; De Alberti, Giordano; Battiston, Giancarlo; and Covini, Romano, to Montedison S.p.A. Process for preparing unsaturated carboxylic acids by gas phase catalytic oxidation of the corresponding aldehydes. 4,113,769, Cl. 562-534.000.

Paginton, Philip Norman, to Westinghouse Brake & Signal Co. Ltd. Brake actuator. 4,113,070, Cl. 188-196.00F.

Pako Corporation: *See—*
Diesch, Robert E., 4,112,801, Cl. 83-586.000.

Palfrey, Lesley Francis; and Fellows, Ronald John, to Thorn Domestic Appliances (Electrical) Ltd. Control system for drier. 4,112,589, Cl. 34-48.000.

Palkes, Mark, to Exxon Research & Engineering Co. Solar energy collector. 4,112,918, Cl. 126-270.000.

Palmer, Dale A., to Monroe Auto Equipment Company. Piston valve assembly for a shock absorber. 4,113,072, Cl. 188-282.000.

Palmer, Harold D.: *See—*
Nelkin, Arthur; Skinner, Dale D.; Wilson, Donald G.; and Palmer, Harold D., 4,114,063, Cl. 310-334.000.

Palmer, Jack P. Apparatus for driving wheeled vehicles. 4,113,043, Cl. 180-33.00A.

Panetta, Anthony. Fire safety Christmas ornament. 4,113,020, Cl. 169-26.000.

Panin, Vladlen Iosifovich: *See—*
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, 4,113,833, Cl. 423-131.000.

Pankove, Jacques Isaac; and Lampert, Murray Alfred, to RCA Corporation. Method of passivating a semiconductor device by treatment with atomic hydrogen. 4,113,514, Cl. 148-1.500.

Pankove, Jacques Isaac; and Marlowe, Frank Jerome, to RCA Corporation. Solid state oscilloscope. 4,114,095, Cl. 324-121.00R.

Pantukh, Boris Izrailevich: *See—*
Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Sobolev, Valerian Mikhailovich; Rutman, Grigory Iosifovich; Logutov, Igor Jurievich; and Dolidze, Vladimir Romanovich, 4,113,976, Cl. 568-789.000.

Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., to American Cyanamid Company. Unsaturated imidazolines. 4,113,934, Cl. 526-258.000.

Pap, Zsolt: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, 4,113,287, Cl. 285-137.00R.

Papenfuhs, Theodor; and Volk, Heinrich, to Hoechst Aktiengesellschaft. Metal-containing disazomethine compounds, process for preparing them and their use as colorants. 4,113,759, Cl. 260-439.00R.

Paquette, Edmund T.: *See—*
O'Toole, Jerome M.; and Paquette, Edmund T., 4,113,330, Cl. 312-184.000.

Paquette, Rolland. Adjustable door latch striker. 4,113,293, Cl. 292-341 180.

Park-Ohio Industries, Inc.: *See—*
Lewis, John C., 4,114,010, Cl. 219-10.410.

Parker, Adrian Roger, to Partech (Electronics) Limited. Photoelectric sensing head with wiping means. 4,114,038, Cl. 250-239.000.

Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, to Anumin Pty. Limited. Method of producing solutions containing cuprous ions. 4,113,848, Cl. 423-512.00A.

Parker-Hannifin Corporation: *See—*
Hoffman, Robert K.; and Franson, David C., 4,112,968, Cl. 137-427.000.

Parkes, Alvin E., to Raymond Lee Organization, Inc., The, a part interest. Scavenging valve device. 4,112,940, Cl. 128-188.000.

Parkhitko, Vladimir Mikhailovich: *See—*
Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich, 4,112,702, Cl. 62-123.000.

Parks-Cramer Company: *See—*
Werst, Lyman L., 4,112,665, Cl. 57-81.000.

Parsons, Bruce B.; and Wolfe, Denis G., to Robertshaw Controls Company. Thermally responsive actuator. 4,114,129, Cl. 337-387.000.

Partech (Electronics) Limited: *See—*
Parker, Adrian Roger, 4,114,038, Cl. 250-239.000.

Parton, Brian, to Imperial Chemical Industries Limited. Quaternized azo dyestuffs. 4,113,717, Cl. 260-146.00R.

Pasinski, Ralph R. Multiple operation traverse apparatus and methods of constructing and utilizing same. 4,112,995, Cl. 160-126.000.

Pastor, Stephen D.; and Grover, Martin M., to National Starch and Chemical Corporation. Pressure sensitive adhesive compositions. 4,113,792, Cl. 260-834.000.

Patel, Gordhan M.: *See—*
Collin, Alvaro L.; and Patel, Gordhan M., 4,112,693, Cl. 405-132.000.

Patella, Ralph F.; and Kuzma, Edward J., to Celanese Corporation. Use of multifunctional monomers in the preparations of emulsions to be used in adhesives. 4,113,540, Cl. 156-327.000.

Patellis, Anargiros Pete: *See—*
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., 4,113,801, Cl. 260-876.00B.

Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen m.b.H.: *See—*
Wiedenmann, Hans, 4,114,066, Cl. 313-315.000.

Paterson, Thomas: *See—*
Wood, Hamish Christopher Swan; and Paterson, Thomas, 4,113,859, Cl. 424-180.000.

Patterson, George: *See—*
Putman, Edgar N.; Patterson, George; Wimer, Scotty; and McCool, John B., 3rd, 4,113,650, Cl. 252-363.500.

Patterson, James A. Water level controller for swimming pool gutter. 4,112,526, Cl. 4-172.170.

Patton, Ray F.: *See—*
Fono, Andrew; and Patton, Ray F., 4,113,427, Cl. 8-34.000.

Pauchard, Jean-Paul: *See—*
Siegrist, Adolf Emil; and Pauchard, Jean-Paul, 4,113,937, Cl. 542-463.000.

Paulnack, Carl Lewis: *See—*
Katz, Lewis Emanuel; and Paulnack, Carl Lewis, 4,113,547, Cl. 156-612.000.

Pautsch, Gunthard; and Kohlstette, Werner, to Westfalia Separator Aktiengesellschaft. Centrifuge whose drum casing is continuously cooled by a coolant circulated within an insert disposed in the solids chamber. 4,113,172, Cl. 233-11.000.

Pawsat, Carlton P.; and Humlong, Robert F., to Wald Manufacturing Company, Inc. Bicycle stem and fork tube assembly. 4,113,395, Cl. 403-22.000.

PCR, Inc.: *See—*
Schuman, Paul D.; Tarrant, Paul; Warner, Dale A.; and Westmoreland, Geraldine, 4,113,949, Cl. 544-303.000.

Peanut Research & Testing Laboratories, Inc.: *See—*
Baxley, James Russell, 4,113,889, Cl. 426-509.000.

Pearl, David R., to Gerber Garment Technology, Inc. Fluid jet cutting apparatus. 4,112,797, Cl. 83-177.000.

Pearson, Stephen C., to Hercules Incorporated. Process for rapidly dissolving gels of water-soluble polymers by extrusion, cutting and then slurrying under high shearing forces. 4,113,688, Cl. 260-29.6PM.

Pease, William Thomas, to Alproco, Inc. Level indicating instrument. 4,112,585, Cl. 33-388.000.

Peaster, Bertram Anthony, to Lockheed Corporation. Automatic lubricator. 4,113,061, Cl. 184-41.000.

Pedain, Josef: *See—*
Bock, Manfred; Pedain, Josef; and Uerdingen, Walter, 4,113,705, Cl. 260-859.00R.

Pejouhy, Radi, to Texas Instruments Incorporated. Current interrupting apparatus. 4,114,127, Cl. 337-97.000.

Penberthy, H. Larry. Molten glass homogenizer. 4,113,460, Cl. 65-178.000.

Pennwalt Corporation: *See—*
Hager, Robert Bonner; Toukan, Sameeh Said; and Walter, Gerald Joseph, 4,113,748, Cl. 260-348.430.

Percy, Donald W., to Prelube Corporation. Pre-lube device. 4,112,910, Cl. 123-196.00S.

Perry, James E.: *See—*
Franks, Lawrence A.; Stroup, Steven L.; and Perry, James E., 4,112,794, Cl. 82-64.000.

Peterkin, Melvin E.: *See—*
Lauer, James L.; and Peterkin, Melvin E., 4,113,384, Cl. 356-70.000.

Peters, Klaus-Jurgen: *See—*
Schwartz, Reinhard; Knapp, Heinrich; Riel, Klaus; and Peters, Klaus-Jurgen, 4,112,900, Cl. 123-139.0AW.

Peterson, Durey H.: *See—*
DeBoer, Clarence; Dolak, Lester A.; and Peterson, Durey H., 4,113,855, Cl. 424-117.000.

Petrellis, Nicolas C.: *See—*
Sabol, Albert R.; and Petrellis, Nicolas C., 4,113,634, Cl. 252-32.70E.

Petrick, Paul J., Sr., to Shooting Star Tennis. Ball collector and projector apparatus. 4,112,911, Cl. 124-56.000.

Petrie, Edward M., to Westinghouse Electric Corp. Low temperature cure epoxy-amine adhesive compositions. 4,113,684, Cl. 260-29.2EP.

Petrolite Corporation: *See—*
Oude Alink, Bernardus A., 4,113,730, Cl. 260-286.00A.
Quinlan, Patrick M., 4,113,709, Cl. 424-78.000.

Pfaff Industriemaschinen GmbH: *See—*
Willenbacher, Erich, 4,112,859, Cl. 112-217.100.

PFD/Penn Color, Inc.: *See—*
Putman, Edgar N.; Patterson, George; Wimer, Scotty; and McCool, John B., 3rd, 4,113,650, Cl. 252-363.500.

Pfister, Frieder: *See—*
Hafner, Hans Wilhelm; and Pfister, Frieder, 4,112,752, Cl. 73-147.000.

Pfister Waagen GmbH: *See—*
Hafner, Hans Wilhelm; and Pfister, Frieder, 4,112,752, Cl. 73-147.000.

Pfizer Inc.: *See—*
Barth, Wayne E., 4,113,942, Cl. 544-23.000.
Hamsher, James J.; and Lozanov, Merrill, 4,113,566, Cl. 195-36.00P.
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,113,723, Cl. 260-347.300.
Hess, Hans-Jurgen E., 4,113,766, Cl. 562-503.000.

Pflasterer, Peter W., to Masco Corporation of Indiana. Crystalless scanning radio receiver. 4,114,103, Cl. 325-470.000.

Phifer, Earl Cooper: *See—*
Howard, James Lynn, 4,114,091, Cl. 324-66.000.

Philips Industries Inc.: *See—*
Bowker, Donald R.; Klein, Donald J.; and Rados, Stephen E., 4,113,829, Cl. 264-295.000.

Phillips, Edwin R., to Sperry Rand Corporation. Edge vacuum guide for flexible members. 4,113,247, Cl. 271-264.000.

Phillips, Howard W.: *See—*
Frazier, Albert A.; and Phillips, Howard W., 4,113,147, Cl. 222-131.000.

Phillips, John F., Jr.: *See—*
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., 4,113,842, Cl. 423-308.000.

Phillips Petroleum Company: *See—*
Billings, William G., 4,113,784, Cl. 260-607.0AR.
Dale, Glenn H., 4,113,575, Cl. 203-62.000.
Doss, Richard C., 4,113,914, Cl. 428-355.000.
Hatcher, Charles S.; and Smith, Kenneth E., 4,112,667, Cl. 57-157.00S.
Hitzman, Donald O., 4,113,017, Cl. 166-303.000.
Louthan, Rector P.; and Doss, Richard C., 4,113,707, Cl. 528-279.000.
Moczygemba, George A., 4,113,930, Cl. 526-25.000.
Mowery, Richard A., Jr., 4,112,743, Cl. 73-61.10C.
Ragains, Wilbur G., 4,112,766, Cl. 73-422.0GC.
Stapp, Paul R., 4,113,971, Cl. 560-246.000.
Stoller, Frederick L., 4,113,827, Cl. 264-280.000.

Phillips, Reginald Andrew; Hamilton, Terence; and Thompson, Arthur David, to Dobson Park Industries Limited. Funneling machine with inclined advancing rams. 4,113,316, Cl. 299-31.000.

Phinney, John M., to Falk Corporation, The. Marine propulsion control system with engine idle boost. 4,113,077, Cl. 192-.098.

Picha, Donald A., to International Harvester Company. Rotary knife adjuster assembly. 4,112,654, Cl. 56-98.000.

Pickelman, Dale M., Sr.; and Wessling, Ritchie A., to Dow Chemical Company, The. Process for preparing substantially linear water-soluble interpolymeric interfacially spreading polyelectrolytes. 4,113,710, Cl. 526-30.000.

Pickering & Company, Inc.: *See—*
Alexandrovich, George, 4,113,266, Cl. 274-37.000.
Wittenberg, Roland C., 4,113,267, Cl. 274-37.000.

Pickrell, John W. Container handling and transporting apparatus. 4,113,120, Cl. 214-38.00D.

Pielkenrood, Jacob, to Pielkenrood-Vinitex B.V. Separation device provided with a coalescence apparatus. 4,113,629, Cl. 210-522.000.

Pielkenrood-Vinitex B.V.: *See—*
Pielkenrood, Jacob, 4,113,629, Cl. 210-522.000.

Pieper, Helmut: *See—*
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, 4,113,777, Cl. 260-570.900.

Pierce, Donald, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Flexible aerofoils. 4,113,210, Cl. 244-219.000.

Pierce, Donald Cameron. Device for cutting ovals in mats or glass sheets. 4,112,793, Cl. 82-1.300.

Pierce, Walker L., Jr.: *See—*
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., 4,113,920, Cl. 428-565.000.

Pierre, Michel: *See—*
Lesas, Claude H.; and Pierre, Michel, 4,113,936, Cl. 536-56.000.

Pieters, Wim J. M.; and Carlson, Emery J., to Allied Chemical Corporation. Catalyst of chlorination and combined chlorination/fluorination based on copper/calcium/fluoride. 4,113,655, Cl. 252-438.000.

Pietrusza, Arthur Jacob; and Kent, Harry James, to Dravo Corporation. Rotary scraper in a rotary drum assembly. 4,113,413, Cl. 435-222.000.

Pigerol, Charles; de Cointet de Fillain, Paul; and Nanthavong, Souli, to S. A. Labaz. 2-Phenyl-indole derivatives. 4,113,736, Cl. 260-326.160.

Pike, Harold L., to Aspen Laboratories. Medical electronic apparatus and components. 4,112,950, Cl. 128-303.140.

Pike, Kenneth: *See—*
Nees, John; and Pike, Kenneth, 4,113,476, Cl. 75-166.00C.
Nees, John; and Pike, Kenneth, 4,113,477, Cl. 75-166.00C.

Pilkington Brothers Limited: *See—*
Cross, Raymond Peter, 4,113,458, Cl. 65-114.000.

Pillar, Walter O., to Arco Polymers, Inc. Molding expandable styrene polymer particles. 4,113,672, Cl. 521-60.000.

Pillsbury, Paul W.; and DeCorso, Serafino M., to Westinghouse Electric Corp. Apparatus and method for starting a large gas turbine having a catalytic combustor. 4,112,675, Cl. 60-39.060.

Pine, Lloyd A.: *See—*
Riley, Kenneth L.; and Pine, Lloyd A., 4,113,656, Cl. 252-439.000.

Pingry, Carl Oscar, III: *See—*
Boyd, William Weller; Grafe, Robert Joseph; and Pingry, Carl Oscar, III, 4,114,139, Cl. 340-147.00R.

Pirlet, Robert Alfred, to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie. Inspecting the interior of an enclosure. 4,112,763, Cl. 73-355.00R.

Pitchford, Peter R. Metal pallet. 4,112,854, Cl. 108-56.100.

Pitfield, Adrian: *See—*
Thompson, John; and Pitfield, Adrian, 4,113,643, Cl. 252-90.000.

Pitney-Bowes, Inc.: *See—*
Brana, George; and Russell, John J., 4,113,641, Cl. 252-62.10P.
Storace, Anthony, 4,113,040, Cl. 177-211.000.

Pittoors, Jan Gustaaf: *See—*
Goransson, Lars Roland; van Oorschot, Gosewinus Franciscus; and Pittoors, Jan Gustaaf, 4,113,450, Cl. 55-97.000.

Plantard, Dominique: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,113,456, Cl. 65-5.000.

Plasteco, Inc.: *See*—
Sandow, Kiyoshi, 4,112,620, Cl. 49-8.000.
Platt Saco Lowell Limited: *See*—
Lappage, James; Doggett, Neil; and Yates, Stephen William, 4,112,662, Cl. 57-34.0AT.
Plattner, Werner, executor: *See*—
Stach, Kurt, deceased; Bosies, Elmar; Heerdt, Ruth; Kuhnle, Hans-Frieder; and Schmidt, Felix Helmut, 4,113,871, Cl. 424-272.000.
Ploeger, Walter, Jr., to Filmon Process Corp. Printing ribbon. 4,113,392, Cl. 400-240.100.
Poeling, David L.: *See*—
Ouellette, Joseph Fernand; and Poeling, David L., 4,112,776, Cl. 73-665.000.
Poinsard, Elisabeth Michele; and Poinsard, Robert Gaston, to Establissement Valvin. Apparatus for purifying carbon dioxide vapors of fermenting liquids. 4,112,829, Cl. 99-277.000.
Poinsard, Robert Gaston: *See*—
Poinsard, Elisabeth Michele; and Poinsard, Robert Gaston, 4,112,829, Cl. 99-277.000.
Poisson, Bernard, to Regie Nationale des Usines Renault. Self-cleaning ejector-filter. 4,113,000, Cl. 164-227.000.
Polak's Frutal Works, Inc.: *See*—
DeSimone, Robert Santora, 4,113,645, Cl. 252-187.00H.
Polaroid Corporation: *See*—
Choinski, Edward J., 4,113,903, Cl. 427-420.000.
Driscoll, John J.; and Wareham, Richard R., 4,114,166, Cl. 354-76.000.
Evans, David H.; and Greenwald, Richard B., 4,113,738, Cl. 260-327.00M.
Pole, Robert Vladimir; and Werlich, Harald Willy, to International Business Machines Corporation. Holographic opaque document scanner. 4,113,343, Cl. 350-3.710.
Polotsky, Vadim Evgenievich: *See*—
Vasiliev, Vladimir Sergeevich; Annenberg, Ernest Alexandrovich; Livshits, Abram Lazarevich; Polotsky, Vadim Evgenievich; and Lakhtjukhov, Valery Mikhailovich, 4,114,015, Cl. 219-69.00W.
Ponczak, Samuel; and Olmstead, John Aaron, to RCA Corporation. Method of forming a curved implanted region in a semiconductor body. 4,113,516, Cl. 148-1.500.
Ponomarenko, Jury Filippovich: *See*—
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, 4,113,287, Cl. 285-137.00R.
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Poskitt, Walter Edward, to IMASCO Limited. Electronic moisture meter. 4,114,090, Cl. 324-61.0QS.
Possati, Mario, to Finike Italiana Marposs Soc. in Accomandita Semplice di Mario Possati & C. Measuring and control apparatus for internal grinding machines. 4,112,629, Cl. 51-165.930.
Pound, Thomas Charles; and Gouldson, Eric John, to Northern Telecom Limited. Paper pulp insulated cable and method of manufacture. 4,113,534, Cl. 156-56.000.
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Hahn, Ernest A., 4,113,893, Cl. 427-44.000.
Hardies, Donald E.; and Rinehart, Jay K., 4,113,878, Cl. 424-301.000.
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Pressley, Robert J.; and Fahlen, Theodore S., to GTE Sylvania Incorporated. Apparatus and method for initiating electrical discharge in a laser. 4,114,114, Cl. 331-94.5PE.
Preston, Edward George; and Doerman, Eryk Stefan, to Molins Limited. Testing of cigarettes. 4,112,954, Cl. 131-21.00R.
Price, Brian George, to Imperial Chemical Industries Limited. Acrylic sheet having improved thermoshaping properties. 4,113,803, Cl. 260-885.000.
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Fleisch, Herbert A.; and Felix, Rolf, 4,113,862, Cl. 424-204.000.
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Ranko, Jerry; and Ranko, Frederick E. Lawn mowing brush cutter. 4,112,656, Cl. 56-320.100.

Rao, Babu Y.; Nolan, John T., Jr.; and Estes, John H., to Texaco Inc. Hydroisomerization of normal paraffin with a catalyst of noble metal, alumina support and chlorine. 4,113,789, Cl. 260-683.680.

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Chinery, Jack Joseph, 4,114,096, Cl. 324-158.00D.
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Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Koutroulos, Jean, to Neste Oy. Photosensitive material containing di-iodopropyl cellulose, process for its manufacture and the use of this material. 4,113,483, Cl. 96-1.0PC.
Romey, Ingo: *See*—
Kroger, Carl; Romey, Ingo; and Kolling, Georg, 4,113,817, Cl. 264-120.000.
Rones, Josef; Moller, Siegfried; and Hoch, Helmut, to Oxy Metal Industries Corporation. Corrosion inhibitor for metal surfaces. 4,113,498, Cl. 106-14.130.
Rose, John Brewster; and Staniland, Philip Anthony, to Imperial Chemical Industries Limited. Production of aromatic polymers. 4,113,699, Cl. 528-126.000.
Rosenthal, Arthur Lee; Alpern, Marvin; and Meisch, Charles Edward, to Howmedica Inc. Apparatus for collecting body fluid. 4,112,949, Cl. 128-278.000.
Rosenthal, Isadore; Exner, Lawrence J.; Niksa, Gregory J.; Weiss, Warren I.; and Young, Maurice G., to Rohm and Haas Company. Asymmetric skein dyeing. 4,112,714, Cl. 68-206.000.
Ross, Ian Norman: *See*—
Gates, John William Charles; Hall, Roy Geoffrey Noel; Ross, Ian Norman; and Stevens, Richard Frederick, 4,113,388, Cl. 356-110.000.
Ross, John P.; and Bernardi, Carl E., to National Semiconductor Corporation. Method for plating semiconductor chip headers. 4,113,577, Cl. 204-15.000.
Rossmanith, Otto, to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung. Hose pump with friction drive of hollow, resilient roller means. 4,113,409, Cl. 417-477.000.
Roth, Haye: *See*—
Gudenau, H. W.; Konig, Horst; Rath, Gero; and Roth, Haye, 4,113,468, Cl. 75-12.000.
Rousseau, George L.; and Snyder, Richard C., to Pullman Incorporated. Resilient constant contact center bearing assembly. 4,112,851, Cl. 105-199.00C.
Rowland, Bob G.: *See*—
Johnson, Peter E.; and Rowland, Bob G., 4,113,927, Cl. 429-143.000.
Royce Chemical Company: *See*—
Fono, Andrew; and Patton, Ray F., 4,113,427, Cl. 8-34.000.
Royon, Jean Paul: *See*—
Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, 4,113,596, Cl. 204-180.00R.
Ruby, William S.: *See*—
Hochstrasser, Otto; and Ruby, William S., 4,113,977, Cl. 13-2.00R.
Ruckel, Erwin Richard; and Wang, Long Shyong, to Arizona Chemical Company. Polymerization of α-pinene. 4,113,653, Cl. 252-429.00B.
Rudd, Wallace C.: *See*—
DuBosque, Clayton, Jr.; Rudd, Wallace C.; and Allen, Richard J., 4,112,566, Cl. 29-157.30C.
Ruenzi, Kurt. Apparatus for automatically feeding individual sheets from a stack through an office machine. 4,113,244, Cl. 271-4.000.
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, to WABCO Westinghouse GmbH. Digital control circuit for producing acceleration and deceleration control signals in an antiskid control system. 4,113,322, Cl. 303-105.000.
Rumpp, Gerhard: *See*—
Kuhlmann, Wolf; and Rumpp, Gerhard, 4,112,813, Cl. 85-74.000.
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., to Gas Developments Corporation. Air conditioning process. 4,113,004, Cl. 165-3.000.
Russell, John J.: *See*—
Brana, George; and Russell, John J., 4,113,641, Cl. 252-62.10P.
Russell, William Norman; Bruton, James Isaac; and Twilley, Ian Charles, to Allied Chemical Corporation. Process for preparing high strength polyamide and polyester filamentary yarn. 4,113,821, Cl. 264-210.00F.
Rutgerswerke Aktiengesellschaft: *See*—
Gardziella, Arno; and Jellinek, Karl, 4,113,898, Cl. 427-195.000.
Spengler, Hans; Bucksch, Gunter; and Morgenstern, Manfred, 4,113,931, Cl. 526-64.000.
Ruti Machinery Works Ltd.: *See*—
Freisler, Erhard, 4,112,981, Cl. 139-102.000.
Ruti Machinery Works Ltd: *See*—
Oderbolz, Fredy; and Bebie, Paul, 4,112,983, Cl. 139-446.000.
Rutman, Grigory Iosifovich: *See*—
Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Sobolev, Valerian Mikhailovich; Rutman, Grigory Iosifovich; Logutov,

Igor Jurievich; and Dolidze, Vladimir Romanovich, 4,113,976, Cl. 568-789.000.
Rybny, Charles B.; Trebellas, John C.; and Sargent, Donald E., to Celanese Corporation. Trihalogenated hydrocarbons as co-photoinitiators. 4,113,592, Cl. 204-159.160.
Ryder, Lyle C.: *See*—
Hill, Robert W.; Onnen, William G.; and Ryder, Lyle C., 4,113,825, Cl. 264-262.000.
Rylander, DeMaris C. Child's playhouse type collapsible structure. 4,112,635, Cl. 52-69.000.
Ryzhov, Vladimir Dmitrievich; Litvinenko, Semen Kirillovich; Leikin, Roman Samuilovich; Kulberg, Anton Yanovich; Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich. Device for contactless separation of individual ferromagnetic components from a flow of components. 4,113,142, Cl. 221-171.000.
S. A. Beghin-Say: *See*—
Lesas, Claude H.; and Pierre, Michel, 4,113,936, Cl. 536-56.000.
S. A. Labaz: *See*—
Pigerol, Charles; de Cointet de Fillain, Paul; and Nanthavong, Souli, 4,113,736, Cl. 260-326.160.
Saab-Scania AB: *See*—
Bos, Frans, 4,113,302, Cl. 296-137.00J.
Sabol, Albert R.; and Petrellis, Nicolas C., to Standard Oil Company (Indiana). Metal aryl dithiophosphates and their manufacture. 4,113,634, Cl. 252-32.70E.
Sachetto, Jean-Pierre: *See*—
Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Koutroulos, Jean, 4,113,483, Cl. 96-1.0PC.
Sackmann, Gunter; Hendricks, Udo-Winfried; Honig, Hans-Ludwig; Kolb, Gunter; and Muller, Friedhelm, to Bayer Aktiengesellschaft. Emulsions of resinic acid isocyanates as sizing agents for paper. 4,113,506, Cl. 106-238.000.
Saegusa, Shigeharu: *See*—
Kiuchi, Mitsuyuki; Amagami, Keizo; Maeda, Shigeru; and Saegusa, Shigeharu, 4,114,009, Cl. 219-10.49R.
Sahara, Takeshi: *See*—
Obinata, Shiro; Hashimoto, Shigeru; and Sahara, Takeshi, 4,113,106, Cl. 209-167.000.
Said, Sami I.; and Mutt, Viktor. Vasoactive lung polypeptides. 4,113,711, Cl. 260-112.00R.
Saijo, Shigeyoshi: *See*—
Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, 4,113,873, Cl. 424-274.000.
Saiki, Atsushi; Okubo, Toshio; and Harada, Seiki, to Hitachi, Ltd. Method for fabricating semiconductor device and etchant for polymer resin. 4,113,550, Cl. 156-656.000.
Sailas, Vaino, to Valmet Oy. Method of making strip-covered roll. 4,112,565, Cl. 29-148.40D.
Sain, Paul E., to Games Research Associates. Simulated golf game and materials therefor. 4,113,260, Cl. 273-245.000.
Saint-Gobain Industries: *See*—
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,113,456, Cl. 65-5.000.
Mattmuller, Rene, 4,113,459, Cl. 65-135.000.
St. Luke's Hospital: *See*—
Hashim, George A., 4,113,858, Cl. 424-177.000.
Saito, Isamu. Extracting black tea and coffee and closed extractor therefor. 4,112,830, Cl. 99-300.000.
Saito, Toranosuke: *See*—
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, 4,113,795, Cl. 260-874.000.
Saito, Toshinori: *See*—
Kai, Fumio; Saito, Toshinori; Seki, Shigeo; and Kawasaki, Toyoaki, 4,113,944, Cl. 544-27.000.
Sakai Chemical Industry Co., Ltd.: *See*—
Abe, Kazunobu; Rikimaru, Hiroaki; Yamazaki, Iwao; and Hasegawa, Hiroshi, 4,113,660, Cl. 252-455.00R.
Sakai, Masaaki: *See*—
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, 4,113,264, Cl. 274-15.00R.
Sakamoto, Yohei: *See*—
Kato, Hisao; and Sakamoto, Yohei, 4,112,602, Cl. 37-55.000.
Sakanaka, Takao, to Hitachi, Ltd. Coupling device of oil feeding pipe for rolling mill. 4,112,729, Cl. 72-236.000.
Sakurai, Toshio; Shimada, Shoji; and Kamimura, Yoshiharu, to Nippon Steel Corporation. Rust-proof lubricant compositions. 4,113,635, Cl. 252-49.600.
Sala, Angelo, to Massey-Ferguson Services N.V. Improvements in or relating to controls for hydraulic valves. 4,112,976, Cl. 137-636.200.
Saladin, Emil: *See*—
Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, 4,113,669, Cl. 521-108.000.
Sales, Buenaventura Z. Draw strings puller and fastener. 4,112,551, Cl. 24-117.000.
Salles, Yvon; Leger, Pierre; and David, Gerard Andre, to U.S. Philips Corporation. Apparatus for etching the edges of semiconductor plates. 4,113,543, Cl. 156-345.000.
Salomon, Georges Pierre Joseph, to S.A. des Etablissements Francois Salomon & Fils. Devices for fastening ski boots. 4,112,557, Cl. 24-69.0SK.
Samuelson, Hans Olof, to Mo Och Domsjo Aktiebolag. Sodium sulfide pulping with hydrogen sulfide generation. 4,113,553, Cl. 162-34.000.
Samuelsson, Kurt Anders, to Telefonaktiebolaget L M Ericsson. Method for improvement of crosstalk attenuation between adjacent channels in a time division multiplex system. 4,113,987, Cl. 179-15.0AN.
Sanderson, Richard Barton, to Bell Telephone Laboratories, Incorporated. Voltage controlled current sources for active hybrid circuit. 4,113,996, Cl. 179-170.0NC.
Sandhu, Mohammad Akram; and Tingler, Kenneth Lloyd, to Eastman Kodak Company. Amorphous polyester adhesives for photographic materials. 4,113,493, Cl. 96-67.000.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,112,713, Cl. 68-5.00E.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Selvage curling prevention apparatus for a knitted cloth. 4,112,713, Cl. 68-5.00E.
Sandor, Leslie W., to Electric Machinery Mfg. Company. Welding of laminations of core-plated silicon steel. 4,114,019, Cl. 219-137.00R.
Sandow, Kiyoshi, to Plasteco, Inc. Smoke and heat vent. 4,112,620, Cl. 49-8.000.
Sandoz, Inc.: *See*—
Denzer, Max; and Smith, Joseph A., 4,113,727, Cl. 544-362.000.
Sands, Terry Michael. Board game apparatus with water ejecting device. 4,113,259, Cl. 273-241.000.
Sandy, Frank; and Schulz, Manfred B., to Raytheon Company. Wide band low loss acoustic wave device. 4,114,119, Cl. 333-72.000.
Sanford, Dale J., to Curfman, Brainerd, Harris, Bell, Weigans and Depew. Apparatus for disassembling pallets. 4,112,578, Cl. 29-700.000.
Sangamo Weston, Inc.: *See*—
Andreaggi, Joseph R., 4,113,342, Cl. 339-176.0MP.
Sanko Kaihatsu Kagaku Kenkyusho: *See*—
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, 4,113,795, Cl. 260-874.000.
Sano, Hiroshi, to Tomy Kogyo Co., Inc. Toy garage. 4,112,610, Cl. 46-12.000.
Sano, Takezo; Kobayashi, Akira; and Inoue, Haruo, to Sumitomo Chemical Company, Limited. Method for producing strong-acid cation exchange fiber by treating fibrous polyethylene with gaseous sulfur trioxide. 4,113,666, Cl. 521-29.000.
Santa Fe International Corp.: *See*—
Chang, Nuke Ming; Remkes, Elmer R.; and Cook, William, Jr., 4,112,695, Cl. 405-163.000.
Sanyo-Kokusaku Pulp Co., Ltd.: *See*—
Shirakawa, Kiyoshi, 4,113,168, Cl. 229-37.00R.
Saoyama, Yoshihito: *See*—
Nomaki, Koji; and Saoyama, Yoshihito, 4,112,868, Cl. 118-429.000.
Sarfati, Pierre, to Thomson-CSF. Arrangement enabling the contrast to be improved between the main echo video-frequency signal and a secondary echo video-frequency signal received by a pulse compression radar. 4,114,154, Cl. 343-17.2PC.
Sargent, Donald E.: *See*—
Rybny, Charles B.; Trebellas, John C.; and Sargent, Donald E., 4,113,592, Cl. 204-159.160.
Satake, Yasuo: *See*—
Nojiri, Shoji; Kanzaki, Hisao; Yasoshima, Nobuyuki; Satake, Yasuo; and Ogawa, Kenichi, 4,113,990, Cl. 179-84.00R.
Sato, Hideaki: *See*—
Okunishi, Hiromu; Nakaji, Hideki; Suwa, Hiroyuki; and Sato, Hideaki, 4,112,732, Cl. 72-334.000.
Sato, Jiro, to Fujiwa Kika Kabushiki Kaisha. Pouring method and apparatus therefor. 4,112,998, Cl. 164-136.000.
Sato, Masamichi, to Fuji Photo Film Co., Ltd. Method for producing a photomask. 4,113,486, Cl. 96-36.000.
Sato, Masamichi; and Fujii, Itsuo, to Fuji Photo Film Co., Ltd. Spin coating process. 4,113,492, Cl. 96-67.000.
Sato, Seii: *See*—
Yamaguchi, Hisashi; Sato, Seii; Iemori, Toshiaki; and Andoh, Shizuo, 4,114,069, Cl. 315-169.0TV.
Sato, Takami: *See*—
Kojimoto, Susumu; Sato, Takami; and Mori, Toshio, 4,113,814, Cl. 264-89.000.
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, to Sony Corporation. Phonograph record player. 4,113,264, Cl. 274-15.00R.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Portable label printing and applying machine. 4,113,544, Cl. 156-384.000.
Satoh, Isao: *See*—
Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, 4,113,608, Cl. 209-1.000.
Satoh, Shui: *See*—
Deguchi, Hidetaka; Kikuchi, Shoji; Wada, Hajime; Satoh, Shui; and Endo, Takaya, 4,113,491, Cl. 96-66.00R.
Satou, Kouichirou: *See*—
Manabe, Kenshi; and Satou, Kouichirou, 4,114,052, Cl. 307-279.000.
Saucy, Gabriel: *See*—
Cohen, Noal; and Saucy, Gabriel, 4,113,740, Cl. 260-340.90R.
Saunders Valve Company Limited: *See*—
Jones, Alan Philip, 4,113,826, Cl. 264-269.000.
Sauvage, Joseph. Drafting machine. 4,112,548, Cl. 19-243.000.
Savage, Bobbie O. Method and apparatus for selectively preventing or permitting sap flow to control bud formation. 4,112,616, Cl. 47-1.00R.
Savage, Bobbie O. Method and apparatus for selectively preventing or permitting systemic sap flow to control bud formation. 4,112,618, Cl. 47-58.000.
Savanick, George A.; and Krawza, Walter G., to United States of

America, Interior. Well perforating method for solution well mining. 4,113,314, Cl. 299-4.000.

Savitt, Jacob, to United States of America, Navy. Apparatus for detonating across a gap. 4,112,845, Cl. 102-27.00R.

Sawada, Takamasa: *See—*
Sone, Yoshiaki; Sawada, Takamasa; and Shirai, Masanari, 4,113,377, Cl. 355-45.000.

Saxe, Robert L.; Thompson, Robert I.; and Forlini, Matthew, to Research Frontiers Incorporated. Light valve, light valve suspension materials and suspension therefor. 4,113,362, Cl. 350-362.000.

Scaife, Colin, to Reckitt & Colman Products Limited. Method of preparing and administering a foam enema. 4,112,942, Cl. 128-225.000.

Schaaf, Thomas K.: *See—*
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,113,723, Cl. 260-347.300.

Schacham, Samuel E.: *See—*
Epstein, Max; Marhic, Michel E.; and Schacham, Samuel E., 4,114,112, Cl. 331-94.50C.

Schafer, Werner; Buchwald, Holger; and Bischoff, Dieter, to Carl Freudenberg, Firma. Heat resistant nonwoven fabric and method of manufacturing same. 4,113,537, Cl. 428-220.000.

Schafers, Heinrich Bernhard. Dowels and process for anchoring dowels. 4,112,814, Cl. 85-75.000.

Schafft, Hugo Willy, to Motorola, Inc. Electro-optic matrix display. 4,113,352, Cl. 350-150.000.

Scharff, Dieter: *See—*
Haage, Karl; and Scharff, Dieter, 4,113,907, Cl. 428-111.000.

Scheid, Lloyd J. Movable partition wall system. 4,112,647, Cl. 52-481.000.

Scheidler, Ralph E. Dual voltage battery system and electronic switch therefor. 4,114,082, Cl. 320-7.000.

Schenk, Bernd, to ITW-Ateco G.m.b.H. Filler connection for vehicles driven by internal combustion engines. 4,113,300, Cl. 296-1.00C.

Schenk, Hanspeter, to Givaudan Corporation. 2-Ethyl-6,6-dimethyl-2-cyclohexene-1-carboxylic acid ethyl ester perfume compositions. 4,113,663, Cl. 252-522.000.

Scher, Bernard B. Fishing pole holding apparatus. 4,112,607, Cl. 43-17.000.

Scherenberg, Dieter: *See—*
Assenheimer, Jurgen; Bianchi, Valerio; Brettschneider, Johannes; Latsch, Reinhard; and Scherenberg, Dieter, 4,112,879, Cl. 123-32.0EA.

Schering AG: *See—*
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Arnold, Hanfried, 4,113,751, Cl. 260-397.400.

Scheuermann, Horst: *See—*
Opgenorth, Hans-Joachim; and Scheuermann, Horst, 4,113,732, Cl. 260-305.000.

Schibbye, Hjalmar; and Eriksson, Lennart, to Svenska Rotor Maskiner Aktiebolag. Method and means for cooling the oil in a system including a compressor with oil supply, as well as such systems. 4,112,701, Cl. 62-84.000.

Schiller, Rolf. Refuse collecting system and a vehicle and container for use therein. 4,113,125, Cl. 214-302.000.

Schillinger, John D. Precision grader. 4,113,402, Cl. 404-91.000.

Schippers, Heinz; Hensen, Friedhelm; Koslowski, Gerhard; and Czerwon, Dieter, to Barmag Barmer Maschinenfabrik AG. Process for producing low shrinkage film bands. 4,113,935, Cl. 526-351.000.

Schlatter, James M.; and Goodmonson, Owen, to G. D. Searle & Co. Method for cleaving the peptide-resin bond in solid phase peptide synthesis by hydrogenolysis. 4,113,713, Cl. 260-112.50R.

Schlecht, Helmut: *See—*
Distler, Harry; Schlecht, Helmut; and Hartert, Erwin, 4,113,764, Cl. 260-465.50A.

Schlesinger, Sheldon I., to American Can Company. Compositions with organohalogen compound and diazonium salts as photoinitiators of epoxy compounds in photo-polymerization. 4,113,497, Cl. 96-115.00P.

Schliephake, Dietrich: *See—*
Kurandt, Hans-Friedrich; and Schliephake, Dietrich, 4,113,835, Cl. 423-170.000.

Schlosberg, Seymour; and Lerman, Michael J., to De Dietrich (USA), Inc. Method for repairing protectively lined reactor vessels. 4,112,572, Cl. 29-401.00R.

Schmid, Emil: *See—*
Keiner, Hildegard; Schmid, Emil; and Richly, Walter, 4,113,896, Cl. 427-108.000.

Schmidt, Erich, to Maschinenfabrik Zuckermann Komm. Ges. Duplicating grinding machine. 4,112,628, Cl. 51-140.000.

Schmidt, Felix Helmut: *See—*
Stach, Kurt, deceased; Bosies, Elmar; Heerdt, Ruth; Kuhnle, Hans-Frieder; and Schmidt, Felix Helmut, 4,113,871, Cl. 424-272.000.

Schmidt, Robert W. Adhesive dispensing device. 4,113,152, Cl. 222-485.000.

Schnall, Gunther: *See—*
Eppe, Rudolf; Schnall, Gunther; Mullritter, Ludwig; Beck, Johann; and Hartwig, Karl, 4,113,373, Cl. 355-8.000.

Schneider, Carl Michael, to Siemens Aktiengesellschaft. Electronic telephone system featuring switching networks having thyristors for single-wire switching. 4,113,989, Cl. 179-18.0GF.

Schneider, Friedrich: *See—*
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Schneider, Heinz-Walter: *See—*
Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, 4,113,754, Cl. 260-429.00R.

Schoen, William: *See—*
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Schott, Charles W. Glass bead product. 4,113,915, Cl. 428-402.000.

Schrauzer, Gerhard N.; and Guth, Ted D., to University of California, The Regents of the. Photoreduction of nitrogen. 4,113,590, Cl. 204-157.10R.

Schreyer, Gerd: *See—*
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,113,747, Cl. 260-348.250.

Schroeder, Guenter: *See—*
Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, 4,113,762, Cl. 260-463.000.

Schroth, Gerhard Wolfgang: *See—*
Fuhrman, Gunther Georg; Krogmann, Uwe Jonny; and Schroth, Gerhard Wolfgang, 4,112,856, Cl. 110-165.00R.

Schubert, Bernhard: *See—*
Bardenhagen, Dietrich; and Schubert, Bernhard, 4,112,651, Cl. 53-449.000.

Schulman, Jerome L.; and Kaplan, Jay, to Children's Memorial Hospital, The. Method and apparatus for measuring and treating hyperactivity in human beings. 4,112,926, Cl. 128-2.00S.

Schulz, Friedrich Wilhelm: *See—*
Kiefer, Udo; von Loeben, Wolf; and Schulz, Friedrich Wilhelm, 4,113,393, Cl. 356-155.000.

Schulz, Manfred B.: *See—*
Sandy, Frank; and Schulz, Manfred B., 4,114,119, Cl. 333-72.000.

Schulze, Heinz; and Waddill, Harold G., to Texaco Development Corporation. Polyether diamide epoxy additives. 4,113,697, Cl. 528-94.000.

Schumacher, Ignatius; and White, James E., to Monsanto Company. Acrylic polymerization inhibition. 4,113,574, Cl. 203-8.000.

SCHUMAG Schumacher Metallwerke Gesellschaft mit beschankter Haftung: *See—*
Wetzels, Walter, 4,112,625, Cl. 51-33.00W.

Schumag Schumacher Metallwerke Gesellschaft mit beschrankter Haftung: *See—*
Greven, Johann; and Mostert, Johann, 4,112,730, Cl. 72-290.000.

Schuman, Paul D.; Tarrant, Paul; Warner, Dale A.; and Westmoreland, Geraldine, to PCR, Inc. 5-Fluorouracil derivatives. 4,113,949, Cl. 544-303.000.

Schumann, Werner Adolf: *See—*
Haarhoff, Pierre Cloete; and Schumann, Werner Adolf, 4,113,448, Cl. 55-17.000.

Schundehutte, Karl Heinz: *See—*
Hugl, Herbert; Schundehutte, Karl Heinz; Trautner, Kersten; and Wolfrum, Gerhard, 4,113,428, Cl. 8-41.00R.

Schuster, Herbert: *See—*
Bischoff, Jurgen; Kowitz, Friedrich; Ott, Karl-Heinz; Schuster, Herbert; Rohr, Harry; and Weitzel, Hans, 4,113,796, Cl. 260-876.00R.

Schuster, Joachim: *See—*
Noack, Rolf; Schuster, Joachim; and Lohse, Udo, 4,112,728, Cl. 72-154.000.

Schwan, Thomas J., to Morton-Norwich Products. Inc. 2-[[6-Methoxy-(3,4-dihydro-2H-1-benzopyranyl)]amino]-1-phenylpropanol hydrochloride. 4,113,743, Cl. 260-345.500.

Schwartz, Reinhard; Knapp, Heinrich; Riel, Klaus; and Peters, Klaus-Jurgen, to Robert Bosch GmbH. Fuel injection system. 4,112,900, Cl. 123-139.0AW.

Schweier, Gunther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, to BASF Aktiengesellschaft. Manufacture of homopolymers and copolymers of α-monoolefins. 4,113,933, Cl. 526-124.000.

Schweiger, Fritz, to Hochtemperatur-Kernkraftwerk GmbH (HKG) Gemeinsames Europaisches Unternehmen. Method of removing the decay heat of radioactive fission products. 4,113,559, Cl. 176-38.000.

Schwerdtel, Wulf: *See—*
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,113,747, Cl. 260-348.250.

Schwirten, Kurt: *See—*
Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, 4,113,754, Cl. 260-429.00R.

Schwob, Hans Peter: *See—*
Von Allmen, Martin; and Schwob, Hans Peter, 4,114,018, Cl. 219-121.0LM.

Scientific Dimensions, Inc.: *See—*
O'Connell, Joseph J., 4,113,217, Cl. 248-221.300.

Scintrex Limited: *See—*
Kaufman, Aleksander Arkadi, 4,114,086, Cl. 324-1.000.

Scott, Donald M., to Fibre Containers Company. Packing box for china. 4,113,096, Cl. 206-523.000.

Scott, Herman B. Coffee blenders. 4,112,831, Cl. 99-306.000.

Scott, Mark P.: *See—*
Reinhardt, James R.; and Scott, Mark P., 4,113,113, Cl. 213-43.000.

Scott Paper Company: *See—*
Colby, Donald B., 4,112,855, Cl. 108-159.000.

Scott, Timothy C.: *See—*
Davis, Gerald L.; and Scott, Timothy C., 4,112,974, Cl. 137-625.290.

Sealectro Corporation: *See—*
Baio, Alfred R.; and Genovese, David L., 4,114,028, Cl. 235-458.000.

Seatek Corporation: *See—*
Bergman, Gunnar B., 4,112,864, Cl. 114-265.000.

Seaver, William H. Apparatus for enabling the motion of a scriber to be reproduced. 4,112,597, Cl. 35-36.000.

Sebby, Carl M. Tow bar with towed vehicle suspension feature. 4,113,272, Cl. 280-402.000.

Seco Tools Aktiebolag: *See—*
Loqvist, Kaj-Ragnar, 4,112,564, Cl. 29-148.40D.

Secretary of State for Social Services, The: *See—*
Duff, Ian David; Kennedy, John Hamilton; and Bunce, Roger Abraham, 4,113,437, Cl. 422-63.000.

Seifert, Hermann: *See—*
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,113,747, Cl. 260-348.250.

Seiferth, Reinhard: *See—*
Wiedemann, Kurt; and Seiferth, Reinhard, 4,114,152, Cl. 343-7.700.

Seikagaku Kogyo Co., Ltd.: *See—*
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, 4,113,568, Cl. 195-68.000.

Seiko Koki Kabushiki Kaisha: *See—*
Onda, Eiichi; Watanabe, Masanori; Nakagawa, Tadashi; Nemoto, Ichiro; and Koyama, Mitsuo, 4,114,174, Cl. 354-249.000.

Seki, Shigeo: *See—*
Kai, Fumio; Saito, Toshinori; Seki, Shigeo; and Kawasaki, Toyoaki, 4,113,944, Cl. 544-27.000.

Seki, Teruya: *See—*
Kamano, Yoshiaki; Michishita, Kazuhiko; Seki, Teruya; and Tanaka, Ichiro, 4,113,680, Cl. 260-397.450.

Sekiguchi, Tadao, to Trio Kabushiki Kaisha. Digital frequency display device. 4,114,101, Cl. 325-455.000.

Sekiguchi, Tetsuo: *See—*
Minagawa, Motonobu; Ohzeki, Toshio; and Sekiguchi, Tetsuo, 4,113,678, Cl. 260-23.70M.

Sekihara, Takeshi; Emura, Tomoyuki; and Murashige, Masayuki, to Sumitomo Chemical Company, Limited. Process for polymerizing vinyl chloride monomer. 4,113,932, Cl. 526-74.000.

Sekino, Jun: *See—*
Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, 4,113,882, Cl. 424-317.000.

Sekisui Kaseikin Kogyo Kabushiki Kaisha: *See—*
Matsui, Takashi; Sugimura, Sadao; and Noo, Kunio, 4,113,824, Cl. 264-230.000.

Sekmakas, Kazys, to DeSoto, Inc. Rapid curing high solids thermosetting coatings. 4,113,793, Cl. 260-850.000.

Sekoulov, Ivan; and Muller, Wolf-Rudiger, to Sulzer Brothers Limited. Method of improving the backwashing of fixed beds formed of granular materials. 4,113,612, Cl. 210-17.000.

Sekoulov, Ivan; and Muller, Wolf-Rudiger, to Sulzer Brothers Limited. Method of improving the operation of backwashable fixed beds formed of granular materials. 4,113,613, Cl. 210-17.000.

Semenov, Vladimir Ivanovich: *See—*
Glushkov, Alexandr Ivanovich; Krutov, Sergei Vasilievich; Semenov, Vladimir Ivanovich; and Gusev, Anatoly Fedorovich, 4,112,547, Cl. 17-57.000.

Senkus, Raymond: *See—*
Andrews, Jeffrey F.; Mullin, Therese A.; and Senkus, Raymond, 4,113,854, Cl. 424-81.000.

Seo, Mamoru; and Uenishi, Akio, to Mitsubishi Denki Kabushiki Kaisha. Coupling circuit using a photocoupler. 4,114,054, Cl. 307-311.000.

Servo Corporation of America: *See—*
Glazar, Arthur J., 4,113,211, Cl. 246-169.00A.

Seubert, Jurgen; Thomas, Herbert; and Andrews, Peter, to Merck Patent Gesellschaft mit Beschrankter Haftung. 2-Acyl-4-oxo-pyrazino-isoquinoline derivatives and process for the preparation thereof. 4,113,867, Cl. 424-250.000.

Seuter, Friedel: *See—*
Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,113,872, Cl. 424-273.00P.
Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,113,957, Cl. 548-377.000.

Severdia, Anton; and Joseph, Adrian. Rotisserie and clockwork motor therefor. 4,112,832, Cl. 99-421.0HH.

Sfredda, Albert Patrick. Torque transmission device. 4,112,788, Cl. 74-804.000.

SGL Industries, Inc.: *See—*
Instone, John C., 4,113,334, Cl. 339-22.00R.

Shackle, Dale Richard: *See—*
Spatz, Sydney Martin; and Shackle, Dale Richard, 4,113,282, Cl. 282-27.500.

Shaffer, John W.: *See—*
Armstrong, Donald E.; Shaffer, John W.; Marecek, Paul M.; and Audesse, Emery G., 4,113,424, Cl. 431-95.00A.

Shah, Champak C.: *See—*
Svedas, Stanley; and Shah, Champak C., 4,113,677, Cl. 260-23.00R.

Shakespeare of Arkansas, Inc.: *See—*
Stewart, Alan; and Majefski, Richard Lee, 4,114,074, Cl. 318-257.000.

Shanker, Irvin Paul; and Tryciecky, Teodozij, to Medcor, Inc. Pacer stimulator with improved lead connector. 4,112,953, Cl. 128-419.00P.

Sharp, John Howard: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 4,113,848, Cl. 423-512.00A.

Shaughnessy, William J.: *See—*
Koether, Bernard G.; and Shaughnessy, William J., 4,113,623, Cl. 210-167.000.

Shaw, Harry, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Aerodynamic lifting mechanisms. 4,113,205, Cl. 244-20.000.

Shaw, John B. Positive displacement gas expansion engine with low temperature differential. 4,112,688, Cl. 60-669.000.

Shaw, Julian David: *See—*
Cook, John Gerald; and Shaw, Julian David, 4,114,094, Cl. 324-115.000.

Sheets, Kerney T. High rise sprinklers. 4,113,181, Cl. 239-206.000.

Shein, Jury Gheorghievich: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, 4,113,287, Cl. 285-137.00R.

Shell Internationale Research Maatschappij, B.V.: *See—*
Collins, Michael H., 4,113,901, Cl. 427-236.000.

Shell Oil Company: *See—*
Hoff, Siebe; Ockers, Gerhardus; Buitelaar, Arnold A.; and Van De Kraats, Eduard J., 4,113,442, Cl. 44-66.000.
Meijs, Franciscus H., 4,113,015, Cl. 166-295.000.
Wulfers, Thomas F., 4,113,640, Cl. 252-51.50A.

Shephard, Margaret Claire; Sugavanam, Balsubramanyan; Worthington, Paul Anthony; Collins, David John; and Griffin, David, to Imperial Chemical Industries Limited. Herbicidal formulations. 4,113,465, Cl. 71-92.000.

Sherwin, William Claude, to Nortec Inc. Ski boot heel restraining apparatus. 4,113,275, Cl. 280-615.000.

Sherwin-Williams Company, The: *See—*
Heyman, Duane A., 4,113,952, Cl. 548-305.000.

Shetty, Bola Vithal, to Purdue Frederick Company, The. Process for the preparation of iodophor compounds and methods for stabilizing iodophor pharmaceutical compositions containing the same. 4,113,857, Cl. 424-150.000.

Shibano, Yoshizo, to Sumitomo Electric Industries, Ltd. Magnetic current antenna. 4,114,161, Cl. 343-741.000.

Shibata, Akio: *See—*
Hirota, Nobuyoshi; and Shibata, Akio, 4,113,673, Cl. 260-8.000.

Shibata, Tadashi: *See—*
Shigeta, Masayuki; and Shibata, Tadashi, 4,113,064, Cl. 187-1.00R.

Shibazaki, Kenji: *See—*
Murata, Tomoji; and Shibazaki, Kenji, 4,113,375, Cl. 355-14.000.
Nakamura, Yoshihiro; Shibazaki, Kenji; Kono, Tateomi; Inagaki, Syotaro; and Murata, Tomoji, 4,113,374, Cl. 355-14.000.

Shiga, Tetsuo; Ozaki, Masaru; Arakawa, Tatsumi; and Kobayashi, Hidehiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Dry image forming material. 4,113,496, Cl. 96-114.100.

Shigeta, Masayuki; and Shibata, Tadashi, to Hitachi, Ltd. Elevator car mounting. 4,113,064, Cl. 187-1.00R.

Shiina, Fumio, to Hitachi, Ltd. Optical card reader for setting frequency division ratio of programmable counter for use in synthesizer tuners. 4,114,045, Cl. 250-569.000.

Shikibo Limited: *See—*
Terada, Yasuhiko; Yasuda, Jun; and Kuriyama, Masao, 4,113,431, Cl. 8-120.000.

Shimada, Shoji: *See—*
Sakurai, Toshio; Shimada, Shoji; and Kamimura, Yoshiharu, 4,113,635, Cl. 252-49.600.

Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, to Kawasaki Steel Corporation. Method for forming a heat-resistant insulating film on a grain oriented silicon steel sheet. 4,113,530, Cl. 148-113.000.

Shimek, Daniel C.: *See—*
Shimek, Ronald J.; and Shimek, Daniel C., 4,112,913, Cl. 126-120.000.

Shimek, Ronald J.; and Shimek, Daniel C. Free standing heating unit. 4,112,913, Cl. 126-120.000.

Shimizu, Hidemi: *See—*
Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, 4,113,882, Cl. 424-317.000.

Shimizu, Junichi; Hara, Takashi; Iwakura, Tatsuya; and Itaya, Yoshiro, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Method of processing fermented soybeans and food products prepared therefrom. 4,113,892, Cl. 426-602.000.

Shimizu, Makoto: *See—*
Nakada, Tetsuro; Shimizu, Makoto; and Yoshinaga, Mayumi, 4,113,239, Cl. 266-137.000.

Shimizu, Masami: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Shimizu, Masami; Yoshikawa, Ryoichi; and Aizawa, Hiroshi, 4,114,173, Cl. 354-238.000.

Shinomura, Toshihiko, to Nippon Oil Company Ltd. Synthetic paper. 4,113,908, Cl. 428-113.000.

Shinshu Seiki Kabushiki Kaisha: *See—*
Minowa, Masahiro, 4,113,391, Cl. 400-120.000.

Shirai, Masanari: *See*—
Sone, Yoshiaki; Sawada, Takamasa; and Shirai, Masanari, 4,113,377, Cl. 355-45.000.

Shirakawa, Kiyoshi, to Sanyo-Kokusaku Pulp Co., Ltd. Bottom structure of cardboard type liquid packing container. 4,113,168, Cl. 229-37.00R.

Shishido, Tadao; Hara, Hiroshi; and Arai, Atsuaki, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material capable of providing stable color images. 4,113,495, Cl. 96-100.00R.

Shishido, Tadao: *See*—
Yamada, Minoru; Shishido, Tadao; and Arai, Atsuaki, 4,113,488, Cl. 96-56.000.

Shmorgunenko, Nikolai Stepanovich: *See*—
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, 4,113,833, Cl. 423-131.000.

Shoemaker, Arthur H., to American Optical Corporation. Microscope illuminator for both transmitted and vertical microscopy. 4,113,344, Cl. 350-87.000.

Shoemaker, Robert H.; and Wood, William G. Liquid additions to fused chemical baths. 4,113,511, Cl. 134-10.000.

Shogo, Iizuka; Mitsuo, Endo; Mitsugu, Watanabe; Toshio, Iizuka; and Kenji, Usui, to Yazaki Corporation. Process and apparatus for producing a wire-harness. 4,114,014, Cl. 219-56.000.

Shooting Star Tennis: *See*—
Petrick, Paul J., Sr., 4,112,911, Cl. 124-56.000.

Shotwell, Allen M. Boat loader and unloader construction. 4,113,126, Cl. 214-450.000.

Show, Roger; and Webb, Robert. Process for converting waste dead-burned magnesium oxide-containing material into useful product. 4,113,834, Cl. 423-155.000.

Showa Sangyo Kabushiki Kaisha: *See*—
Watanabe, Haruo; and Negishi, Masaaki, 4,113,752, Cl. 260-424.000.

Shpirt, Mikhail Yakovlevich: *See*—
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, 4,113,833, Cl. 423-131.000.

Shumway, Durland K.: *See*—
Kenkare, Divaker B.; and Shumway, Durland K., 4,113,852, Cl. 424-46.000.

Shutt, Sidney G., to Rockwell International Corporation. Dual mode laser optics control for ring laser gyro. 4,113,387, Cl. 356-106.0LR.

SI Handling Systems, Inc.: *See*—
Brown, William L.; and Reagan, Larry L., 4,113,119, Cl. 214-16.40A.

Sidhu, Baldip Singh: *See*—
Syred, Nicholas; Grant, John; and Sidhu, Baldip Singh, 4,112,977, Cl. 137-812.000.

Sidley, Manfred: *See*—
Theunissen, Eos Lee, 4,113,195, Cl. 242-55.300.

Sidorowicz, Frank: *See*—
Richardson, Eugene E.; and Sidorowicz, Frank, 4,113,765, Cl. 260-505.00S.

Siegel, Hardo: *See*—
Aquila, Werner; Hoffmann, Werner; Himmele, Walter; and Siegel, Hardo, 4,113,781, Cl. 260-599.000.

Siegle, Peter; Kuhle, Engelbert; Hammann, Ingeborg; Homeyer, Bernhard; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Sulfonic acid-N-methylamido-N-sulfenyl-N-methyl-carbamic acid esters. 4,113,876, Cl. 424-278.000.

Siegrist, Adolf Emil; and Pauchard, Jean-Paul, to Ciba-Geigy Corporation. Stilbene compounds. 4,113,937, Cl. 542-463.000.

Siegrist, Adolf Emil; and de Sousa, Bernardo, to Ciba-Geigy Corporation. Stilbene compounds. 4,113,938, Cl. 542-464.000.

Siemens Aktiengesellschaft: *See*—
Bauch, Helmut; Mohrmann, Karl Heinz; and Koppehele, Frithjof, 4,114,107, Cl. 330-56.000.
Baur, Guenter; and Greubel, Waldemar, 4,113,360, Cl. 350-285.000.
Gaertner, Waldemar, 4,113,347, Cl. 350-96.240.
Gerndt, Christian, 4,113,345, Cl. 350-96.150.
Kiefer, Udo; von Loeben, Wolf; and Schulz, Friedrich Wilhelm, 4,113,393, Cl. 356-155.000.
Krauss, Guenter, 4,114,118, Cl. 333-71.000.
Mattuschka, Werner, 4,114,062, Cl. 310-326.000.
Mentschel, Hellmuth, 4,112,876, Cl. 123-3.000.
Schneider, Carl Michael, 4,113,989, Cl. 179-18.0GF.
Wiedemann, Kurt; and Seiferth, Reinhard, 4,114,152, Cl. 343-7.700.

Sigel-Gfeller, Alwin. Conveyor apparatus for the interior of pipelines. 4,112,850, Cl. 104-138.00G.

Sigmund, Hermann. Process for the production of silicon layers. 4,113,548, Cl. 156-622.000.

Sigurdsson, Per Arne, to Sigurdssons Mek. Verkstad. Method of pressure treatments of materials. 4,113,846, Cl. 423-446.000.

Sigurdssons Mek. Verkstad: *See*—
Sigurdsson, Per Arne, 4,113,846, Cl. 423-446.000.

Sikli, Bert J., to Staines, Robert. Scissors lift. 4,113,065, Cl. 187-18.000.

Sillion, Bernard: *See*—
Cohen, Choua; and Sillion, Bernard, 4,113,637, Cl. 252-51.50A.

Simmons, Kenneth C.; Champlin, Harry C., Jr.; Livorsi, Carl F.; and Wucik, Joseph A., Jr., to Posi-Seal International, Inc. Extended temperature range valve seal. 4,113,268, Cl. 277-168.000.

Simmons, William D.: *See*—
Anderson, Lowell M.; and Simmons, William D., 4,112,692, Cl. 405-271.000.

Simon, Donald J.; and Fitzmayer, Louis H., to General Electric Company. Choke for combined microwave and self-cleaning oven. 4,114,013, Cl. 219-10.55D.

Simon, Pierre, to Union Chimique Continentale-U.C.C. Process for the preparation of alpha-pyrones. 4,113,742, Cl. 260-343.500.

Simon, Stefan: *See*—
Friese, Axel; and Simon, Stefan, 4,113,083, Cl. 198-480.000.

Simpson, Dayton M.: *See*—
Lammert, Wayne F.; Simpson, Dayton M.; and Desai, Ardeshir R., 4,112,698, Cl. 405-167.000.

Simpson, Harold G., to Star Manufacturing Company of Oklahoma. Prefabricated watertight structural system. 4,112,632, Cl. 52-11.000.

Sims, Anson; and Jones, Lawrence T., to Aurora Products Corporation. Jaw breaker game. 4,113,261, Cl. 273-249.000.

Singer Company, The: *See*—
Feltz, Albert J.; and Deck, Howard C., 4,113,368, Cl. 352-159.000.

Sinke, Gerard C.: *See*—
Langhorst, Martin A.; Sinke, Gerard C.; and Mossner, Elmer H., 4,113,471, Cl. 75-101.00R.

Sintef: *See*—
Ugelstad, John, 4,113,687, Cl. 260-29.6XA.

Sirtl, Erhard: *See*—
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, 4,113,532, Cl. 148-174.000.

Sisk, Francis J.; and Veyo, Stephen E., to Electric Power Research Institute, Inc. Fuel fired supplementary heater for heat pump. 4,112,705, Cl. 62-238.000.

Sjostrand, Gunnar; and Sjostrand, Staffan, to Musikindustriell Forskning MIFO AB. Stringed instrument for play training. 4,112,809, Cl. 84-465.000.

Sjostrand, Staffan: *See*—
Sjostrand, Gunnar; and Sjostrand, Staffan, 4,112,809, Cl. 84-465.000.

Skalka, Gerald P., to Victor Stanley, Inc. Bench. 4,113,312, Cl. 297-454.000.

Skinner, Dale D.: *See*—
Nelkin, Arthur; Skinner, Dale D.; Wilson, Donald G.; and Palmer, Harold D., 4,114,063, Cl. 310-334.000.

Skinner, Leon S.; and Taylor, Norman C., to All Sunpower, Inc. Solar energy collector. 4,112,922, Cl. 126-271.000.

Skoli, Sigmund P.: *See*—
Mojonnier, Harry G.; and Skoli, Sigmund P., 4,112,828, Cl. 99-275.000.

Skotchinksy Institut Gornogo Dela: *See*—
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, 4,113,287, Cl. 285-137.00R.

Slater, Charles E.; Dunn, Paul E.; and Mustain, Lewis B., to Mosler Safe Company, The. On-line/off-line automated banking system. 4,114,027, Cl. 235-419.000.

Slavik, John W. Fireplace enclosure with heat exchanger. 4,112,915, Cl. 126-121.000.

Sloan Valve Company: *See*—
Horowitz, Charles, 4,112,961, Cl. 137-102.000.
Horowitz, Charles, 4,113,333, Cl. 339-14.00P.

Small, William H. Shelter construction and method of assembling same. 4,112,956, Cl. 135-1.00D.

Smeets, Lambertus R. J. M.: *See*—
Extra, Piet M. J.; Smeets, Lambertus R. J. M.; Van Bavel, Adrianus W. M.; Van Lieshout, Jacobus J.; and Deckers, Albert T., 4,112,870, Cl. 118-657.000.

Smets, Georges Joseph; and Vandensavel, Jean Marie, to Agfa-Gevaert, N.V. Masked isocyanates. 4,113,734, Cl. 260-308.00D.

Smiley, Leonard H., to Rohm and Haas Company. Foamed cementitious material and composite. 4,113,913, Cl. 428-310.000.

Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich. Freeze desalination and concentration apparatus. 4,112,702, Cl. 62-123.000.

Smith, Adrian P. Corrosion-resistant light-weight spot welding gun. 4,114,017, Cl. 219-90.000.

Smith, George William, to USM Corporation. Tire grinding system. 4,113,186, Cl. 241-24.000.

Smith, Herman W., to Upjohn Company, The. 3,7-Inter-m-phenylene-3-oxa-4,5,6-trinor-13,14-didehydro-11-deoxy-PGE$_1$ compounds. 4,113,961, Cl. 560-53.000.

Smith, Herman W., to Upjohn Company, The. 5-Oxa-13,14-didehydro-11-deoxy-17-phenyl-18,19,20 trinor-PGE$_1$ compounds. 4,113,962, Cl. 560-53.000.

Smith, Herman W., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-17-phenyl-18,19,20-trinor-PGE$_1$ compounds. 4,113,963, Cl. 560-53.000.

Smith, Herman W., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-17-phenyl-18,19,20-trinor-PGF$_1\alpha$ compounds. 4,113,964, Cl. 560-55.000.

Smith, Herman W., to Upjohn Company, The. 3,7-Inter-m-phenylene-3-oxa-13,14-didehydro-11-deoxy-17-phenyl-4,5,6,18,19,20-hexanor-PGF$_1\alpha$ compounds. 4,113,965, Cl. 560-61.000.

Smith, Herman W., to Upjohn Company, The. 3,7-Inter-m-phenylene-3-oxa-4,5,6-trinor-13,14-didehydro-11-deoxy-PGF$_1\alpha$ compounds. 4,113,966, Cl. 560-61.000.

Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corp. Fluid solventless epoxy-anhydride compositions containing metal acetylacetonate accelerators and organic carboxylic acid co-accelerators. 4,113,791, Cl. 260-830.0TW.

Smith, Joseph A.: *See*—
Denzer, Max; and Smith, Joseph A., 4,113,727, Cl. 544-362.000.

Smith, Kenneth E.: *See*—
Hatcher, Charles S.; and Smith, Kenneth E., 4,112,667, Cl. 57-157.00S.

Smith, Richard D., to Kennecott Copper Corporation. Tarnish resistant copper alloy. 4,113,475, Cl. 75-159.000.

Smith, Robert L.; Stokker, Gerald E.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. Substituted 2-aminomethylphenyl sulfamates. 4,113,877, Cl. 424-303.000.

Smith, Rodney I. Impact resistant tongue-and-groove coupling for highway traffic barricades. 4,113,400, Cl. 404-6.000.

Smith, Roy B. Drive shaft "U" joint lubricator. 4,113,060, Cl. 184-6.000.

Smith, Stanley E., to General Motors Corporation. Ball joint with slotted spring biased stud. 4,113,396, Cl. 403-138.000.

Smith, Trevor, to British Gas Corporation. Fluid-flow noise reduction systems. 4,113,050, Cl. 181-230.000.

Smyth, Norman Linfoot, to Britool Limited. Wrenches and other hand tools. 4,112,749, Cl. 73-139.000.

Snam Progetti, S.p.A.: *See*—
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, 4,113,694, Cl. 260-875.000.
Cesca, Sebastiano; Priola, Aldo; and Ferraris, Giuseppe, 4,113,790, Cl. 260-683.15B.

Snedeker, Clarke R.: *See*—
Flower, Robert J.; Snedeker, Clarke R.; and Beatenbough, Paul K., 4,113,007, Cl. 165-81.000.

Sniegowski, Bruno Raymond: *See*—
Clement, George Frederick; and Sniegowski, Bruno Raymond, 4,113,986, Cl. 179-2.00A.

Sniff, Walter Grant, Jr.: *See*—
Featherstone, Harry Edwin; and Sniff, Walter Grant, Jr., 4,114,020, Cl. 219-137.00R.

Snyder, Francis H. Pinless resilient coupling. 4,113,397, Cl. 403-154.000.

Snyder, John M., to Snyder, John M.; Steinberg, Bernard J.; and Halle, Edward. Auxiliary handle for plurality of carrying handles. 4,112,542, Cl. 16-114.00R.

Snyder, Richard C.: *See*—
Rousseau, George L.; and Snyder, Richard C., 4,112,851, Cl. 105-199.00C.

Snyder, Robert C.: *See*—
Bushman, Willard T.; and Snyder, Robert C., 4,114,031, Cl. 235-474.000.

Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich. Inert gas generator based on air jet engine. 4,113,019, Cl. 169-12.000.

Sobolev, Valerian Mikhailovich: *See*—
Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Sobolev, Valerian Mikhailovich; Rutman, Grigory Iosifovich; Logutov, Igor Jurievich; and Dolidze, Vladimir Romanovich, 4,113,976, Cl. 568-789.000.

S.A. des Etablissements Francois Salomon & Fils: *See*—
Salomon, Georges Pierre Joseph, 4,112,557, Cl. 24-69.0SK.

Societe Civile de Recherches et d'Etudes Nouvelles: *See*—
Orzales, Henri-Ange, 4,113,960, Cl. 560-52.000.

Societe Coupax: *See*—
d'Arras, Philippe, 4,112,544, Cl. 17-25.000.

Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C.: *See*—
Richard, Gerard Yves, 4,113,510, Cl. 134-2.000.

Societe de Vente de l'Aluminium Pechiney: *See*—
Gauvry, Robert; and Portalier, Robert, 4,113,473, Cl. 75-148.000.

Societe d'Etudes de Machines Thermiques: *See*—
Bouquet, Jean-Claude, 4,112,883, Cl. 123-52.00M.

Societe Industrielle et Financiere le Profil: *See*—
Boucard, Michel Jean, 4,112,722, Cl. 72-181.000.

Societe Miniere et Metallurgique de Penarroya: *See*—
Casalis, Jean-Arnaud; Teil, Yves; and Motte, Raymond, 4,113,624, Cl. 210-219.000.

Societe Nationale des Poudres et Explosifs: *See*—
Lecolier, Serge L.; and Biehler, Jean-Marie J., 4,113,671, Cl. 521-108.000.

Soeda, Takahiko: *See*—
Gomi, Teruo; Hisa, Yuji; and Soeda, Takahiko, 4,113,716, Cl. 260-123.500.

Sohner, Gerhard: *See*—
Manger, Hansjorg; Sohner, Gerhard; and Hohne, Gerd, 4,112.890, Cl. 123-117.00R.

Soja, Lawrence M.; Stokes, Daniel F.; and Beile, Richard W., to Stone Container Corporation. Display carton. 4,113,100, Cl. 206-602.000.

Solartron Electronic Group Ltd., The: *See*—
Cook, John Gerald; and Shaw, Julian David, 4,114,094, Cl. 324-115.000.

Solco Basel AG: *See*—
Benes, Ivan, 4,113,850, Cl. 424-1.000.

Solex Research Corporation of Japan: *See*—
Watanabe, Morio; and Nishimura, Sanji, 4,113,588, Cl. 204-151.000.

Sone, Yoshiaki; Sawada, Takamasa; and Shirai, Masanari, to Canon Kabushiki Kaisha. Reader-printer. 4,113,377, Cl. 355-45.000.

Sony Corporation: *See*—
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, 4,113,264, Cl. 274-15.00R.
Takizawa, Kazuyuki, 4,113,263, Cl. 274-15.00R.
Tokumoto, Shin-Ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,113,581, Cl. 204-39.000.
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,113,582, Cl. 204-39.000.
Uzuka, Mitsuo, 4,114,073, Cl. 318-138.000.

South African Inventions Development Corporation, The: *See*—
Hasson, Victor Haim; and von Bergmann, Hubertus Michael, 4,114,113, Cl. 331-94.50G.

Southern Chemical Company: *See*—
Cotten, Roger C.; Young, David W.; and Kandanian, Aram Y., 4,113,804, Cl. 260-897.00A.

Southern Imperial, Inc.: *See*—
Donnelli, Joseph W.; and Barnes, Richard D., 4,113,109, Cl. 211-49.00R.

Southwest Research Institute: *See*—
Melton, Rosser B., Jr.; Colburn, John W., Jr.; and Wood, Charles D., III, 4,113,315, Cl. 299-13.000.

Soxil S.p.A.: *See*—
Visconti, Matteo, 4,112,939, Cl. 128-186.000.

Spagnola, Raymond J., Jr. Bingo chip dispenser. 4,113,143, Cl. 221-267.000.

Spatz, Sydney Martin; and Shackle, Dale Richard, to Mead Corporation, The. Pressure-sensitive carbonless copy system and transfer sheet for use therein. 4,113,282, Cl. 282-27.500.

Spaulding, James R., to General Motors Corporation. Temperature compensated internal combustion engine ignition spark vacuum advance system. 4,112,891, Cl. 123-117.00A.

Spaulding, Tedford Hollace, to Bunker Ramo Corporation. Insulation-piercing contact. 4,113,338, Cl. 339-97.00R.

Spence, J. Ronald, to Standard Oil Company (Indiana). Antistatic additives. 4,113,443, Cl. 44-72.000.

Spencer, Boyd La Russell, to Spencer Heads, Inc. Firing deck insert for internal combustion engines. 4,112,906, Cl. 123-191.00A.

Spencer, David R.: *See*—
Goldsborough, Robert R.; Spencer, David R.; and West, Samuel F., 4,114,156, Cl. 343-112.00S.

Spencer Heads, Inc.: *See*—
Spencer, Boyd La Russell, 4,112,906, Cl. 123-191.00A.

Spencer, Lloyd: *See*—
Christy, Mark H.; and Spencer, Lloyd, 4,113,180, Cl. 239-109.000.

Spengler, Hans; Bucksch, Gunter; and Morgenstern, Manfred, to Rutgerswerke Aktiengesellschaft. Process for the continuous production of indene resins. 4,113,931, Cl. 526-64.000.

Sperry Rand Corporation: *See*—
Lund, Roger Edward, 4,114,191, Cl. 365-2.000.
Phillips, Edwin R., 4,113,247, Cl. 271-264.000.

Spiers, Dennis D. Sheet sling. 4,113,160, Cl. 224-45.00R.

Spies, Hans: *See*—
Held, Manfred; and Spies, Hans, 4,112,844, Cl. 102-19.200.

Spiller, Herbert A., to Monsanto Company, St. Louis, Missouri. Method for treating polyester filaments. 4,112,668, Cl. 57-157.00S.

Spirig, Ernst. Water decomposing apparatus. 4,113,601, Cl. 204-230.000.

Spork, Helmut: *See*—
Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, 4,113,760, Cl. 260-448.20E.

Sprague Electric Company: *See*—
Randall, John J., Jr.; and Bernard, Walter J., 4,113,579, Cl. 204-33.000.

SPS Technologies, Inc.: *See*—
Dey, Ervin J., 4,112,993, Cl. 151-41.740.

Stach, Kurt, deceased (by Plattner, Werner, executor); Bosies, Elmar; Heerdt, Ruth; Kuhnle, Hans-Frieder; and Schmidt, Felix Helmut, to Boehringer Mannheim GmbH. Hypoglycemically and hypolipidemically active derivatives of phenyl-alkane-carboxylic acids. 4,113,871, Cl. 424-272.000.

Stach, Leonard J.; Hotz, Roger D.; and Richter, Sidney B., to Velsicol Chemical Company. Dioxolane substituted amides. 4,113,464, Cl. 71-88.000.

Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; Auel, Theodor; and Kloss, Werner, to Hoechst Aktiengesellschaft. Stabilized red phosphorus and process for making it. 4,113,841, Cl. 423-265.000.

Stahlecker, Fritz; and Stahlecker, Hans. Open end spinning unit with a braking device. 4,112,659, Cl. 57-58.890.

Stahlecker, Hans: *See*—
Stahlecker, Fritz; and Stahlecker, Hans, 4,112,659, Cl. 57-58.890.

Staines, Robert: *See*—
Sikli, Bert J., 4,113,065, Cl. 187-18.000.

Stalego, Charles J., to Owens-Corning Fiberglas Corporation. Apparatus for supplying glass bodies to glass melters. 4,113,457, Cl. 65-11.00R.

Stamicarbon, B.V.: *See*—
Klaasen, Dirk, 4,113,440, Cl. 422-132.000.

Stamicarbon, N.V.: *See—*
Geus, John W., 4,113,658, Cl. 252-454.000.
Stampfli, Harald, to Lucifer S.A. Control system for an electromagnet. 4,114,184, Cl. 361-154.000.
Standard Havens, Inc.: *See—*
Bundy, Richard P., 4,113,449, Cl. 55-96.000.
Standard Oil Company, The: *See—*
White, James F.; and Applequist, Michael D., 4,113,768, Cl. 562-535.000.
Standard Oil Company (Indiana): *See—*
Richardson, Eugene E.; and Sidorowicz, Frank, 4,113,765, Cl. 260-505.00S.
Sabol, Albert R.; and Petrellis, Nicolas C., 4,113,634, Cl. 252-32.70E.
Spence, J. Ronald, 4,113,443, Cl. 44-72.000.
Stang, Peter L.: *See—*
Van Ornum, Joel V.; and Stang, Peter L., 4,113,799, Cl. 260-876.00B.
Staniland, Philip Anthony, to Imperial Chemical Industries Limited. Aromatic polymer production. 4,113,698, Cl. 528-481.000.
Staniland, Philip Anthony: *See—*
Rose, John Brewster; and Staniland, Philip Anthony, 4,113,699, Cl. 528-126.000.
Stanley, William L.: *See—*
Masri, Merle S.; Randall, Virginia G.; and Stanley, William L., 4,113,567, Cl. 195-63.000.
Stapleton, Harold Reginald, to W. Vinten Limited. Tilt mounting heads. 4,113,215, Cl. 248-183.000.
Stapp, Paul R., to Phillips Petroleum Company. Process for preparing diacyloxy olefins. 4,113,971, Cl. 560-246.000.
Star Manufacturing Company of Oklahoma: *See—*
Simpson, Harold G., 4,112,632, Cl. 52-11.000.
Staub, John W. Gun recoil reducer. 4,112,605, Cl. 42-1.00V.
Stauffer Chemical Company: *See—*
Chen, Kon S.; and Majewski, Helmut W., 4,113,504, Cl. 106-97.000.
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., to Chevron Research Company. Carboxylic acid-containing wax fluxes. 4,113,525, Cl. 148-23.000.
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., to Chevron Research Company. Wax flux compositions. 4,113,526, Cl. 148-23.000.
Stearns, David Burrell: *See—*
Rollo, Anita Hand; and Stearns, David Burrell, 4,113,614, Cl. 210-22.00A.
Stearns, Richard S.: *See—*
Thompson, Robert M.; and Stearns, Richard S., 4,113,794, Cl. 260-857.0TW.
Steel, Paul Franklin, to Teledyne Acoustic Research. Input filtering apparatus for loudspeakers. 4,113,983, Cl. 179-1.0VL.
Steer, Philip James: *See—*
Carter, Michael Charles; and Steer, Philip James, 4,114,188, Cl. 364-415.000.
Stein Industrie: *See—*
Deruelle, Jean, 4,113,417, Cl. 431-5.000.
Steinberg, Bernard J.: *See—*
Snyder, John M., 4,112,542, Cl. 16-114.00R.
Steiner, Edwin C.: *See—*
Trucks, Roger O.; and Steiner, Edwin C., 4,113,739, Cl. 260-338.000.
Steiner, H. Karl. Torch igniter. 4,113,423, Cl. 431-128.000.
Steiner, John E., to United States Steel Corporation. Wire-wrapped cylindrical prestressed structures. 4,113,132, Cl. 220-71.000.
Steinfeld, Horst E.; and Mathes, Dieter, to Hoesch Werke Aktiengesellschaft. Resilient rail connection. 4,113,178, Cl. 238-349.000.
Stemmann, Karl; and Holtmeier, Gerhard, to August Stemmann OHG. Method of and apparatus for regulating the brush contact pressure of pantograph assemblies. 4,113,074, Cl. 191-67.000.
Stendel, Wilhelm: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Homeyer, Bernhard; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, 4,113,860, Cl. 424-200.000.
Stephens, Donald Harrison, to Bourns, Inc. Worm gear drive and ratchet system. 4,114,133, Cl. 338-174.000.
Sterling Drug Inc.: *See—*
Surrey, Alexander R.; and Collins, Joseph C., 4,113,774, Cl. 260-558.00D.
Stevens, Richard Frederick: *See—*
Gates, John William Charles; Hall, Roy Geoffrey Noel; Ross, Ian Norman; and Stevens, Richard Frederick, 4,113,388, Cl. 356-110.000.
Stewart, Alan; and Majefski, Richard Lee, to Shakespeare of Arkansas, Inc. Device for electronic direction control of trolling motors. 4,114,074, Cl. 318-257.000.
Stewart, David E., to Empire Metal Products Corp. Roller assembly for sliding screen door, and the like. 4,112,622, Cl. 49-421.000.
Stiles, Kenneth M., to Air Logistics Corporation. Fiber reinforced optical fiber cable. 4,113,349, Cl. 350-96.230.
Still, Robert C., to New Concepts, Inc. Replaceable one piece liner for a gate valve. 4,112,969, Cl. 137-454.200.
Stiltz, Erwin; Hoyer, Rudolf; and Lindenmayer, Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Hammer drill with drive and percussion elements accommodated in a cylinder. 4,113,035, Cl. 173-116.000.
Stockel, Dieter; and Schneider, Friedrich, to Rau, G. Spark plugs for internal combustion engines. 4,112,905, Cl. 123-169.0EL.
Stokes, Daniel F.: *See—*
Soja, Lawrence M.; Stokes, Daniel F.; and Beile, Richard W., 4,113,100, Cl. 206-602.000.
Stokker, Gerald E.: *See—*
Smith, Robert L.; Stokker, Gerald E.; and Cragoe, Edward J., Jr., 4,113,877, Cl. 424-303.000.
Stoll, Max: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 4,113,891, Cl. 426-536.000.
Stoller, Frederick L., to Phillips Petroleum Company. Method and apparatus useful in control of edge uniformity in nonwoven fabrics. 4,113,827, Cl. 264-280.000.
Stone, Alan J.: *See—*
Tertinek, Christian T.; and Stone, Alan J., 4,113,403, Cl. 404-113.000.
Stone Construction Equipment Inc.: *See—*
Tertinek, Christian T.; and Stone, Alan J., 4,113,403, Cl. 404-113.000.
Stone Container Corporation: *See—*
Soja, Lawrence M.; Stokes, Daniel F.; and Beile, Richard W., 4,113,100, Cl. 206-602.000.
Stoneberg, William A.: *See—*
Maass, Edward A.; and Stoneberg, William A., 4,112,598, Cl. 35-53.000.
Storace, Anthony, to Pitney-Bowes, Inc. Null transducer for an analytical balance. 4,113,040, Cl. 177-211.000.
Stork Amsterdam B.V.: *See—*
Witte, Johan Frederik, 4,112,836, Cl. 99-483.000.
Stotz, Manfred: *See—*
Kohler, Werner; Drucker, Gerhard; Kiess, Ulrich; and Stotz, Manfred, 4,113,925, Cl. 429-78.000.
Stournas, Stamoulis; and Heiba, El Ahmadi I., to Mobil Oil Corporation. Oil recovery by surfactant waterflooding. 4,113,632, Cl. 252-8.55D.
Stout, Daniel W. Laser drilling method and system of fossil fuel recovery. 4,113,036, Cl. 175-11.000.
Stovall, Ronald J.: *See—*
Benham, Harold L.; Clark, Steven D.; Huffman, Hubert L.; and Stovall, Ronald J., 4,114,083, Cl. 320-39.000.
Strandly, Ingvald: *See—*
Bugge, Hans Jorgen; Strandly, Ingvald; and Swanberg, Carl Olof, 4,112,982, Cl. 139-425.00A.
Strange, Delbert D.; and Hunts, Ronald M., to Manufacturing Approaches & Total Concepts, Inc. Automatic dadoing machine. 4,112,986, Cl. 144-323.000.
Strathearn Audio Limited: *See—*
McLean, Graham Wilson; and Holt, David, 4,114,060, Cl. 310-163.000.
Strehlke, Gunter; and Osterburg, Gunther, to Deutsche Texaco Aktiengesellschaft. Extractive distillation of acetone. 4,113,780, Cl. 260-593.00P.
Strojny, Edwin J.; Friedli, Hans R.; and Wing, Milton S., to Dow Chemical Company, The. Catalyst for and method of producing maleic anhydride. 4,113,745, Cl. 260-346.750.
Stroup, Steven L.: *See—*
Franks, Lawrence A.; Stroup, Steven L.; and Perry, James E., 4,112,794, Cl. 82-64.000.
Stuart, Fred E., Sr. Nozzle for rotary filter pipe. 4,113,183, Cl. 239-533.130.
Stuart, Linden, Jr.; and Davis, Harry Robert, to Stuart Steel Protection Corporation. Pipe joint wrapping machine. 4,113,545, Cl. 156-392.000.
Stuart Steel Protection Corporation: *See—*
Stuart, Linden, Jr.; and Davis, Harry Robert, 4,113,545, Cl. 156-392.000.
Stubbs, Elmer L., to Thermatron, Inc. Microwave heating method and apparatus. 4,114,011, Cl. 219-10.55M.
Studiengeselischaft Kohle mbH: *See—*
Lehmkuhl, Herbert; and Rabet, Farroch, 4,113,649, Cl. 252-363.500.
Sturm, Michael R. Hood for glass furnace gathering hole. 4,113,461, Cl. 65-324.000.
Sturm, Warren A.: *See—*
Swinehart, Frank, 4,113,999, Cl. 179-179.000.
Suda, Seiji: *See—*
Sugiura, Noboru; and Suda, Seiji, 4,112,903, Cl. 123-148.00E.
Sueyoshi, Akiko: *See—*
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, 4,113,519, Cl. 148-6.15R.
Suga, Shigeru. Electrode operating mechanism for carbon arc lamp. 4,114,067, Cl. 314-134.000.
Sugavanam, Balsubramanyan: *See—*
Shephard, Margaret Claire; Sugavanam, Balsubramanyan; Worthington, Paul Anthony; Collins, David John; and Griffin, David, 4,113,465, Cl. 71-92.000.
Sugimura, Sadao: *See—*
Matsui, Takashi; Sugimura, Sadao; and Noo, Kunio, 4,113,824, Cl. 264-230.000.
Sugiura, Akio: *See—*
Nojiri, Tadao; Sugiura, Akio; and Nomura, Masahiro, 4,114,030, Cl. 235-464.000.
Sugiura, Katuaki: *See—*
Suzuki, Yoshihisa; Sugiura, Katuaki; Suzuki, Osamu; and Tashiro, Ichiro, 4,112,661, Cl. 57-34.00R.
Sugiura, Noboru; and Suda, Seiji, to Hitachi, Ltd. Ignition system for an internal combustion engine. 4,112,903, Cl. 123-148.00E.

Sugiyama, Jun: *See*—
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, 4,113,795, Cl. 260-874.000.
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, to Fuji Photo Film Co., Ltd. Method of forming photographic line and half-tone images. 4,113,489, Cl. 96-60.00R.
Sugiyama, Nobuo: *See*—
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, 4,113,489, Cl. 96-60.00R.
Sullivan, Gerald Leslie. "Strapdown" induction compass transmitter with means to compensate for heading errors during turns and during dives and climbs due to the vertical component of the Earth's magnetic field and due to two cycle error. 4,112,755, Cl. 73-178.00R.
Sullivan, Kevin J., to Corning Glass Works. Blood sample container having an anticoagulant coating of polyvinyl pyrrolidone and a salt of ethylene diamine tetracetate. 4,112,925, Cl. 128-2.00F.
Sullivan, Thomas A. Roller-colloid mill. 4,113,189, Cl. 241-43.000.
Sulzer Brothers Limited: *See*—
Bader, Hartmann, 4,112,980, Cl. 139-92.000.
Sekoulov, Ivan; and Muller, Wolf-Rudiger, 4,113,612, Cl. 210-17.000.
Sekoulov, Ivan; and Muller, Wolf-Rudiger, 4,113,613, Cl. 210-17.000.
Suminsby, John. Pendulous induction compass transmitter including means external to the transmitter to compensate for heading errors in turns due to the vertical component of the Earth's magnetic field and due to two cycle error. 4,112,754, Cl. 73-178.00R.
Sumitomo Chemical Company, Limited: *See*—
Kojimoto, Susumu; Sato, Takami; and Mori, Toshio, 4,113,814, Cl. 264-89.000.
Oshio, Hiromichi; Konishi, Hiroyuki; Matsumura, Shiunzi; Ishikawa, Kikuichi; and Yoneyama, Eiichi, 4,113,463, Cl. 71-76.000.
Sano, Takezo; Kobayashi, Akira; and Inoue, Haruo, 4,113,666, Cl. 521-29.000.
Sekihara, Takeshi; Emura, Tomoyuki; and Murashige, Masayuki, 4,113,932, Cl. 526-74.000.
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, 4,113,864, Cl. 424-225.000.
Sumitomo Electric Industries, Ltd.: *See*—
Doi, Kaname, 4,113,318, Cl. 303-24.00F.
Okita, Koichi, 4,113,912, Cl. 428-290.000.
Shibano, Yoshizo, 4,114,161, Cl. 343-741.000.
Yamaguchi, Yasuo, 4,112,725, Cl. 72-128.000.
Sumitomo Metal Industries, Ltd.: *See*—
Nakada, Tetsurc; Shimizu, Makoto; and Yoshinaga, Mayumi, 4,113,239, Cl. 266-137.000.
Summers, Ernest Moreland: *See*—
Henry, Russell Alger; and Summers, Ernest Moreland, 4,113,899, Cl. 427-290.000.
Sun Ventures, Inc.: *See*—
Thompson, Robert M.; and Stearns, Richard S., 4,113,794, Cl. 260-857.0TW.
Sundman, Frey Viking, to A. Ahlstrom Osakeyhtio. Method and means for drying a fibre material containing cellulose. 4,112,587, Cl. 34-12.000.
Sundstrand Corporation: *See*—
Davis, Gerald L.; and Scott, Timothy C., 4,112,974, Cl. 137-625.290.
Suntech, Inc.: *See*—
Lauer, James L.; and Peterkin, Melvin E., 4,113,384, Cl. 356-70.000.
Neinast, Gary S., 4,113,236, Cl. 254-134.500.
Norton, Richard V., 4,113,763, Cl. 260-465.00D.
Supra Products, Inc.: *See*—
Bradley, Terrag W., 4,112,717, Cl. 70-63.000.
Surrey, Alexander R.; and Collins, Joseph C., to Sterling Drug Inc. N-(Dichloroacetyl) diamine compounds and process of preparing same. 4,113,774, Cl. 260-558.00D.
Susa, Ermanno: *See*—
Mayr, Adolfo; Davoli, Velmore; Leccese, Antonio; and Susa, Ermanno, 4,113,654, Cl. 252-429.00C.
Sutherland, George K.: *See*—
Zelinka, Richard J.; and Sutherland, George K., 4,114,023, Cl. 219-471.000.
Sutton, James Alton, Jr. Ventilation system for poultry or livestock house. 4,113,175, Cl. 236-46.00A.
Sutton, Stephen J.; Holen, J. Robert; and Creager, John E., to General Motors Corporation. Fuel level sender with molded plastic case. 4,114,130, Cl. 338-33.000.
Suwa, Hiroyuki: *See*—
Okunishi, Hiromu; Nakaji, Hideki; Suwa, Hiroyuki; and Sato, Hideaki, 4,112,732, Cl. 72-334.000.
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Motion picture projector. 4,113,369, Cl. 352-194.000.
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, to Director-General Agency of Industrial Science and Technology. Steam reforming reactor. 4,113,441, Cl. 422-197.000.
Suzuki, Hiroshige; Horie, Eizi; and Nagashima, Hideo, to Agency of Industrial Science and Technology, The President of the. Wall structure of hot fluid chamber. 4,112,648, Cl. 52-508.000.
Suzuki, Koichi; Suzuki, Shigeru; and Suzuki, Minoru, to Ricoh Company, Ltd. Apparatus for controlling the toner concentration of a developer used in a dry type developing system. 4,112,867, Cl. 118-7.000.
Suzuki, Minoru: *See*—
Suzuki, Koichi; Suzuki, Shigeru; and Suzuki, Minoru, 4,112,867, Cl. 118-7.000.
Suzuki, Osamu: *See*—
Suzuki, Yoshihisa; Sugiura, Katuaki; Suzuki, Osamu; and Tashiro, Ichiro, 4,112,661, Cl. 57-34.00R.
Suzuki, Shigeru: *See*—
Suzuki, Koichi; Suzuki, Shigeru; and Suzuki, Minoru, 4,112,867, Cl. 118-7.000.
Suzuki, Shoji: *See*—
Koike, Hiroshi; Suzuki, Shoji; and Asakawa, Takeki, 4,113,359, Cl. 350-269.000.
Suzuki, Shosuke: *See*—
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; and Suzuki, Shosuke, 4,113,053, Cl. 181-284.000.
Suzuki, Sukenori: *See*—
Fujita, Masanori; and Suzuki, Sukenori, 4,113,981, Cl. 174-88.00R.
Suzuki, Tadashi: *See*—
Ookubo, Toshio; Nishino, Atsushi; and Suzuki, Tadashi, 4,113,439, Cl. 422-177.000.
Suzuki, Toshihisa: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, 4,113,441, Cl. 422-197.000.
Suzuki, Yasoji, to Tokyo Shibaura Electric Co., Ltd. Counter provided with complementary field effect transistor inverters. 4,114,049, Cl. 307-225.00C.
Suzuki, Yasoji; and Ochii, Kiyofumi, to Tokyo Shibaura Electric Co., Ltd. Semiconductor memory device to reduce parasitic output capacitance. 4,114,192, Cl. 365-189.000.
Suzuki, Yoshihisa; Sugiura, Katuaki; Suzuki, Osamu; and Tashiro, Ichiro, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Open-end spinning machine and a method of stopping the same. 4,112,661, Cl. 57-34.00R.
Svedas, Stanley; and Shah, Champak C., to Turtle Wax, Inc. Polished composition containing microcrystalline wax. 4,113,677, Cl. 260-23.00R.
Svenska Dataregister Aktiebolag: *See*—
Englund, Gosta Roland, 4,112,840, Cl. 101-93.150.
Svenska Rotor Maskiner Aktiebolag: *See*—
Schibbye, Hjalmar; and Eriksson, Lennart, 4,112,701, Cl. 62-84.000.
Svenska Traforskningsinstitutet: *See*—
Johansson, Ingvar, 4,113,542, Cl. 156-335.000.
Nyren, Jan O.; Nordin, Soren B.; and Flodman, Leif A., 4,113,555, Cl. 162-127.000.
Svensson, Einar Gustav-Vilhelm, to Wallbergs Fabriks AB. Apparatus for forming a joint for wire cloth. 4,112,570, Cl. 29-241.000.
Swanberg, Carl Olof: *See*—
Bugge, Hans Jorgen; Strandly, Ingvald; and Swanberg, Carl Olof, 4,112,982, Cl. 139-425.00A.
Swinehart, Frank, to Sturm, Warren A. Hand held communications microphone. 4,113,999, Cl. 179-179.000.
Swiss Aluminium Ltd.: *See*—
Dore, James E., 4,113,241, Cl. 266-227.000.
Fister, Julius C., Jr.; Breedis, John F.; and Pryor, Michael J., 4,113,472, Cl. 75-142.000.
Swodenk, Wolfgang: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,113,747, Cl. 260-348.250.
SWS Silicones Corporation: *See*—
Lewis, Richard Newton, 4,113,690, Cl. 260-37.0SB.
Sybron Corporation: *See*—
Brockway, Charles E., 4,113,309, Cl. 297-408.000.
Sylvester, Bruce J.; and Sylvester, Roger P., to J. G. Sylvester Associates, Inc. Fillet weld inspection system. 4,112,775, Cl. 73-627.000.
Sylvester, Roger P.: *See*—
Sylvester, Bruce J.; and Sylvester, Roger P., 4,112,775, Cl. 73-627.000.
Syracuse, Donald C.: *See*—
Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., 4,112,952, Cl. 128-418.000.
Syred, Nicholas; Grant, John; and Sidhu, Baldip Singh. Vortex diodes. 4,112,977, Cl. 137-812.000.
Sys-Tec, Inc.: *See*—
Zelinka, Richard J.; and Sutherland, George K., 4,114,023, Cl. 219-471.000.
Systems, Science and Software: *See*—
Turner, Philip L., 4,112,738, Cl. 73-32.00R.
Szatmari, Franz: *See*—
Hofmann, Franz; and Szatmari, Franz, 4,113,238, Cl. 366-56.000.
Szema, Li C.: *See*—
Lee, Richard M.; and Szema, Li C., 4,113,406, Cl. 415-115.000.
Szentivanyi, Matyas: *See*—
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, 4,113,868, Cl. 424-251.000.

Tager, Semen Alexandrovich: *See—*
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, 4,113,833, Cl. 423-131.000.

Taguchi, Tetsuya: *See—*
Tsunekawa, Tokuichi; and Taguchi, Tetsuya, 4,114,036, Cl. 250-214.00R.

Taisho Pharmaceutical Co., Ltd.: *See—*
Kamano, Yoshiaki; Michishita, Kazuhiko; Seki, Teruya; and Tanaka, Ichiro, 4,113,680, Cl. 260-397.450.

Takahashi, Akio: *See—*
Oshima, Kathuhide; Takasaki, Haruyuki; and Takahashi, Akio, 4,113,583, Cl. 204-55.00Y.

Takahashi, Kiyoshi: *See—*
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, 4,113,369, Cl. 352-194.000.

Takahashi, Sankichi: *See—*
Koseki, Yasuo; Takahashi, Sankichi; and Nakaoka, Azuma, 4,113,618, Cl. 210-82.000.

Takaiti, Osasi: *See—*
Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, 4,113,873, Cl. 424-274.000.

Takasaki, Haruyuki: *See—*
Oshima, Kathuhide; Takasaki, Haruyuki; and Takahashi, Akio, 4,113,583, Cl. 204-55.00Y.

Takase, Hirobumi; and Utsunomiya, Yutaka, to NHK Spring Co., Ltd. NC Coil spring manufacturing apparatus. 4,112,721, Cl. 72-12.000.

Takemura, Katsuaki: *See—*
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, 4,113,441, Cl. 422-197.000.

Takenoya, Hideaki: *See—*
Kakinuma, Toshihide; Kume, Toshiaki; Takenoya, Hideaki; Makabe, Hachiro; and Watanabe, Kazuo, 4,112,858, Cl. 112-158.00E.

Takeshita, Tetsuo: *See—*
Mukaemachi, Takuji; Takeshita, Tetsuo; and Enami, Shiroh, 4,113,988, Cl. 179-18.0ES.

Takimoto, Hiroyuki: *See—*
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, 4,113,369, Cl. 352-194.000.

Takimoto, Masatami; and Mizutani, Koichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with charcoal canister. 4,112,898, Cl. 123-136.000.

Takiura, Mamoru; and Hayashizaki, Yoshihiro, to Ikegai Tekko Kabushiki Kaisha. Method of dispersing inorganic additives within extruder. 4,113,822, Cl. 264-349.000.

Takizawa, Kazuyuki, to Sony Corporation. Phonograph record player. 4,113,263, Cl. 274-15.00R.

Talbott, John W.; and Logan, James D., to Washington State University Research Foundation. Method of forming a composite mat of directionally oriented lignocellulosic fibrous material. 4,113,812, Cl. 264-24.000.

Talleres Diesel, S.A.: *See—*
Torralba, Jose Esteban, 4,112,902, Cl. 123-140.0FG.

Tamborini, Ariberto; and Tamborini, Giancarlo. Process of the making of extruded thermoplastic bodies and device for the carrying out of the said process. 4,113,820, Cl. 264-173.000.

Tamborini, Giancarlo: *See—*
Tamborini, Ariberto; and Tamborini, Giancarlo, 4,113,820, Cl. 264-173.000.

Tamm, Paul Whitfield, to Chevron Research Company. Method for preparing a hydrodesulfurization catalyst. 4,113,661, Cl. 252-465.000.

Tamura, Nobuhiro: *See—*
Tanabe, Masanori; Ikeda, Masanori; and Tamura, Nobuhiro, 4,113,970, Cl. 560-244.000.

Tanabe, Masanori; Ikeda, Masanori; and Tamura, Nobuhiro, to Asahi Kasei Ko∞yo Kabushiki Kaisha. Process for producing 1,4-diacyloxybutene-2. 4,113,970, Cl. 560-244.000.

Tanabe Seiyaku Co. Ltd.: *See—*
Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, 4,113,873, Cl. 424-274.000.

Tanabe, Yoshio: *See—*
Koike, Sakae; Matsunami, Shoichi; Goto, Yorinobu; and Tanabe, Yoshio, 4,113,838, Cl. 423-235.000.

Tanaka, Akira, to American Safety Equipment Corporation. Safety belt retractor with conjugate return spring means. 4,113,200, Cl. 242-107.000.

Tanaka, Eiji: *See—*
Tokumoto, Shin-Ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,113,581, Cl. 204-39.000.
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,113,582, Cl. 204-39.000.

Tanaka, Ichiro: *See—*
Kamano, Yoshiaki; Michishita, Kazuhiko; Seki, Teruya; and Tanaka, Ichiro, 4,113,680, Cl. 260-397.450.

Tanaka, Shinzo; Tsubamoto, Shinichi; Yamashita, Koichi; Eguchi, Tadashi; and Inoue, Kashirou, to Yanagimoto Seisakusho Co., Ltd. Method and apparatus for collectively sampling a plurality of gaseous phases in desired proportions for gas analysis or other purposes. 4,113,434, Cl. 23-232.00R.

Tanaka, Toshie, to Nifco Inc. Plastic fixing device. 4,112,815, Cl. 85-80.000.

Tanaka, Tsutomu: *See—*
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, 4,113,795, Cl. 260-874.000.

Tanner, Lee E.; and Ray, Ranjan, to Allied Chemical Corporation. Zirconium alloys containing transition metal elements. 4,113,478, Cl. 75-177.000.

Tao, Frank F.: *See—*
Gorbaty, Martin L.; Tao, Frank F.; and Maa, Peter S., 4,113,602, Cl. 208-8.000.

Tarrant, Paul: *See—*
Schuman, Paul D.; Tarrant, Paul; Warner, Dale A.; and Westmoreland, Geraldine, 4,113,949, Cl. 544-303.000.

Tasch, Al F., Jr.: *See—*
Fu, Horng-sen; Holloway, Thomas C.; Tasch, Al F., Jr.; and Chatterjee, Pallab K., 4,112,575, Cl. 29-577.00C.

Tashiro, Ichiro: *See—*
Suzuki, Yoshihisa; Sugiura, Katuaki; Suzuki, Osamu; and Tashiro, Ichiro, 4,112,661, Cl. 57-34.00R.

Tassano, Peter Francis, to Lucas Industries Limited. Apparatus for detecting water in oil. 4,112,744, Cl. 73-61.10R.

Tate, Leslie R.: *See—*
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., 4,113,842, Cl. 423-308.000.

Tatsuzawa, Yoshinobu: *See—*
Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, 4,114,097, Cl. 325-320.000.

Taurus Gumiipari Vallalat: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, 4,113,287, Cl. 285-137.00R.

Taya, Hiroshi: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, 4,113,864, Cl. 424-225.000.

Taylor, Alfred James: *See—*
Lumby, Roland John; North, Bernard; and Taylor, Alfred James, 4,113,503, Cl. 106-73.400.

Taylor, Norman C.: *See—*
Skinner, Leon S.; and Taylor, Norman C., 4,112,922, Cl. 126-271.000.

Taylor, Robert Coleman, to Atlantic Richfield Company. Frothing composition for gypsum dispersions. 4,113,638, Cl. 252-61.000.

Taylor-Winfield Corporation, The: *See—*
Toma, Charles A.; and Haessly, Walter F., 4,114,016, Cl. 219-97.000.

TDK Electronics Co., Ltd.: *See—*
Tokuoka, Yasumichi; and Fukuda, Kazumasa, 4,113,528, Cl. 148-105.000.

Technical Plastics Corporation: *See—*
Hanson, Paul D., Sr., 4,112,638, Cl. 52-169.120.

Technicon Instruments Corporation: *See—*
Burns, Donald Arthur; and Fontanilles, Henry, 4,113,383, Cl. 356-36.000.

Tedeschi, Anthony, to Western Electric Co., Inc. Mercury-wetted sealed contact switch. 4,114,006, Cl. 200-234.000.

Teger, Gerhard: *See—*
Lippacher, Wolfgang; and Teger, Gerhard, 4,113,404, Cl. 408-241.00S.

Teil, Yves: *See—*
Casalis, Jean-Arnaud; Teil, Yves; and Motte, Raymond, 4,113,624, Cl. 210-219.000.

Teledyne Acoustic Research: *See—*
Steel, Paul Franklin, 4,113,983, Cl. 179-1.0VL.

Telefonaktiebolaget L M Ericsson: *See—*
Martensson, Folke Lennart, 4,114,106, Cl. 328-111.000.
Samuelsson, Kurt Anders, 4,113,987, Cl. 179-15.0AN.

Telephone Cables Limited: *See—*
Haines, Ernest Martin, 4,113,350, Cl. 350-96.290.

Teletype Corporation: *See—*
Geis, David G.; and Hodne, Ingard B., 4,114,126, Cl. 335-270.000.

TelTec, Incorporated: *See—*
Luetzow, Edwin J., 4,114,008, Cl. 29-630.00B.

Temme, Helmut, to Gewerkschaft Eisenhutte Westfalia. Scraper chain assemblies. 4,113,084, Cl. 198-731.000.

Tennessee Valley Authority: *See—*
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., 4,113,842, Cl. 423-308.000.

Teodorescu, Constantin, to Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst. Method of and device for attenuating the noise radiated by gas jets. 4,113,048, Cl. 181-220.000.

Terada, Yasuhiko; Yasuda, Jun; and Kuriyama, Masao, to Shikibo Limited. Method for dyeing cellulose fibers by disperse dyes. 4,113,431, Cl. 8-120.000.

Teradyne, Inc.: *See—*
Ashdown, Glynn R.; McCartney, Thomas; and Holmes, Bruce, 4,113,998, Cl. 179-175.30R.

Teraji, Tsutomu: *See—*
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,113,940, Cl. 544-16.000.

Teranishi, Takanori; and Nakashima, Toshihiko, to Nippondenso Co., Ltd. Control system for a motor having a shunt field winding. 4,114,076, Cl. 318-421.000.

Terasawa, Yoshio; and Kimura, Shin, to Hitachi, Ltd. Semiconductor controlled rectifier having an auxiliary region with localized low resistance paths to the control gate. 4,114,178, Cl. 357-38.000.

Terragni, Marco. Extruder and sizer apparatus for hollow plastic sections. 4,113,411, Cl. 425-325.000.

Terry, Ruel Carlton, to In Situ Technology, Inc. Recovering uranium from coal in situ. 4,113,313, Cl. 299-4.000.

Tertinek, Christian T.; and Stone, Alan J., to Stone Construction Equipment Inc. Plate type compactor. 4,113,403, Cl. 404-113.000.

Tetra Pak International AB: *See—*
Carlsson, Lars Christer, 4,113,103, Cl. 206-611.000.

Tetradis, Constantinos. Handle for bags particularly of net or plastic material. 4,112,541, Cl. 16-114.00R.

Tews, Jan Henryk. Two-cycle engine and piston. 4,112,882, Cl. 123-47.00A.

Texaco Development Corporation: *See—*
Gettert, Hans; Jeck, Arnulf; and Werner, Dietmar, 4,113,445, Cl. 48-197.00R.
Schulze, Heinz; and Waddill, Harold G., 4,113,697, Cl. 528-94.000.

Texaco Inc.: *See—*
Herbstman, Sheldon; Webb, Allen N.; and Estes, John H., 4,113,657, Cl. 252-442.000.
Ishiwata, Samford P., 4,112,760, Cl. 73-299.000.
Ledoux, Will A.; Schoen, William; and Kumar, Atul, 4,113,013, Cl. 166-275.000.
Rao, Babu Y.; Nolan, John T., Jr.; and Estes, John H., 4,113,789, Cl. 260-683.680.

Texas Alkyls, Inc.: *See—*
Malpass, Dennis B.; and Yeargin, G. Scott, 4,113,783, Cl. 260-606.50P.

Texas Instruments Incorporated: *See—*
Fu, Horng-sen; Holloway, Thomas C.; Tasch, Al F., Jr.; and Chatterjee, Pallab K., 4,112,575, Cl. 29-577.00C.
Grenier, Aime J., 4,114,122, Cl. 335-8.000.
Grenier, Aime J., 4,114,123, Cl. 335-42.000.
Pejouhy, Radi, 4,114,127, Cl. 337-97.000.

Textron Inc.: *See—*
Moertel, George B., 4,112,555, Cl. 24-205.13C.

Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Shimizu, Masami; Yoshikawa, Ryoichi; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Photographic camera with an operation mode display device. 4,114,173, Cl. 354-238.000.

Th. Goldschmidt AG: *See—*
Laqua, Arnold; and Holtschmidt, Ulrich, 4,113,701, Cl. 260-29.40R.

Thackston, Clyde David; and Alexander, Robert H., to Rockwell International Corporation. Torque wrench air shut-off. 4,113,080, Cl. 192-150.000.

Thayer, Orla E. Axial flow valve. 4,112,806, Cl. 84-390.000.

Thely, Maurice H.: *See—*
Estevenel, Yvette Fr. M. J.; Thely, Maurice H.; and Coulon, Wladimir A., 4,113,816, Cl. 264-113.000.

Thermatool Corp.: *See—*
DuBosque, Clayton, Jr.; Rudd, Wallace C.; and Allen, Richard J., 4,112,566, Cl. 29-157.30C.

Thermatron, Inc.: *See—*
Stubbs, Elmer L., 4,114,011, Cl. 219-10.55M.

Theunissen, Eos Lee, to Sidley, Manfred. Dispensing device for web material in roll form. 4,113,195, Cl. 242-55.300.

Theurer, Josef; Praschl, Wilhelm; and Riessberger, Klaus, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft M.B.H. Load handling vehicle with hydraulic torsion transmitting devices. 4,113,111, Cl. 212-28.000.

Thiry, Geza A. Food processing apparatus. 4,112,834, Cl. 99-450.100.

Tholen, Paul, to Klockner-Humboldt-Deutz Aktiengesellschaft. Multiple working chamber forming combustion machine with exhaust turbo charger. 4,112,684, Cl. 60-606.000.

Thomanek, Franz Rudolf, to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung. Warhead with a disintegrating jacket to house several projectiles. 4,112,847, Cl. 102-67.000.

Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., to United States of America, Health, Education and Welfare. Electrode for artificial pacemaker. 4,112,952, Cl. 128-418.000.

Thomas, Herbert: *See—*
Seubert, Jurgen; Thomas, Herbert; and Andrews, Peter, 4,113,867, Cl. 424-250.000.

Thomas, Richard J., to Robbins & Myers, Inc. Boltless housing for gear heads and the like. 4,112,786, Cl. 74-606.00R.

Thompson, Arthur David: *See—*
Phillips, Reginald Andrew; Hamilton, Terence; and Thompson, Arthur David, 4,113,316, Cl. 299-31.000.

Thompson, James L., to Dow Chemical Company, The. Foaming and silt suspending agent. 4,113,631, Cl. 252-8.55C.

Thompson, John; and Pitfield, Adrian, to Wilkinson Sword Limited. Aerosol foams. 4,113,643, Cl. 252-90.000.

Thompson, Robert I.: *See—*
Saxe, Robert L.; Thompson, Robert I.; and Forlini, Matthew, 4,113,362, Cl. 350-362.000.

Thompson, Robert M.; and Stearns, Richard S., to Sun Ventures, Inc. Copolymer of blocks of random poly(dioxa-amide) and polyamide. 4,113,794, Cl. 260-857.0TW.

Thomsen, Eigild S. Pulp press having a planar dewatering disc below an annular press chamber. 4,113,620, Cl. 210-152.000.

Thomson-CSF: *See—*
Sarfati, Pierre, 4,114,154, Cl. 343-17.2PC.

Thomson, David Summers: *See—*
Jones, Geraint; and Thomson, David Summers, 4,113,879, Cl. 424-304.000.

Thorn Domestic Appliances (Electrical) Ltd.: *See—*
Palfrey, Lesley Francis; and Fellows, Ronald John, 4,112,589, Cl. 34-48.000.

Thrower, Herbert T., Jr.; and Wasness, Donald S., to Thrower, Herbert T., Jr. Light modulator system. 4,114,071, Cl. 315-226.000.

Thurman, Paul G., to Dare Pafco, Inc. Multi-tray basket. 4,113,329, Cl. 312-111.000.

Thyssen Industrie Aktiengesellschaft: *See—*
Hausenblas, Helmut; and Holzforster, Hans-Erich, 4,113,279, Cl. 280-705.000.

Tilley, Jefferson Wright: *See—*
Cohen, Michael Robert; Kierstead, Richard Wightman; and Tilley, Jefferson Wright, 4,113,776, Cl. 260-565.000.

Timin, Mitchell E., to Airco, Inc. Apparatus and method for storing and transporting substrates in a batch-type vacuum process. 4,113,082, Cl. 198-339.000.

Tingler, Kenneth Lloyd: *See—*
Sandhu, Mohammad Akram; and Tingler, Kenneth Lloyd, 4,113,493, Cl. 96-67.000.

Tioxide Group Limited: *See—*
Kay, Peter Dunlop, 4,113,757, Cl. 260-429.500.

Tippmann, Heinrich; and Huber, Wolfgang, to ITT Industries, Inc. Epicyclic friction transmission with torque-dependent pressure-exerting device. 4,112,787, Cl. 74-798.000.

Tisbo, Cosmo N.; and Tisbo, Thomas A., to Custom Plastics, Inc. Shelving apparatus. 4,112,853, Cl. 108-111.000.

Tisbo, Thomas A.: *See—*
Tisbo, Cosmo N.; and Tisbo, Thomas A., 4,112,853, Cl. 108-111.000.

Titus IV, Theodore: *See—*
Bolick, Fred C., Jr.; and Titus IV, Theodore, 4,113,994, Cl. 179-100.1DR.

Tobin, Joseph M., to Westinghouse Electric Corp. Fuel arrangement for high temperature gas cooled reactor. 4,113,563, Cl. 176-84.000.

Todd, Estel R.: *See—*
Dirksing, Robert S.; and Todd, Estel R., 4,114,195, Cl. 366-167.000.

Tokimoto, Tadashi; Kawaguchi, Kazumasa; Izawa, Junji; and Hiraishi, Yoshinobu, to Komatsu Electronci Metals, Co., Ltd. Method of producing high-purity transparent vitreous silica body. 4,113,844, Cl. 423-336.000.

Tokumitsu, Shunji: *See—*
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, 4,113,264, Cl. 274-15.00R.

Tokumoto, Shin-Ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, to Sony Corporation. Electrodeposition process. 4,113,581, Cl. 204-39.000.

Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, to Sony Corporation. Method of adjusting a fused salt electrolytic bath. 4,113,582, Cl. 204-39.000.

Tokuoka, Yasumichi; and Fukuda, Kazumasa, to TDK Electronics Co., Ltd. Method of preventing deterioration of characteristics of ferromagnetic metal or alloy particles. 4,113,528, Cl. 148-105.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Manabe, Kenshi; and Satou, Kouichirou, 4,114,052, Cl. 307-279.000.
Suzuki, Yasoji, 4,114,049, Cl. 307-225.00C.
Suzuki, Yasoji; and Ochii, Kiyofumi, 4,114,192, Cl. 365-189.000.

Tokyo Special Wire Netting Co., Ltd.: *See—*
Ikawa, Reiji, 4,113,810, Cl. 261-98.000.

Toma, Charles A.; and Haessly, Walter F., to Taylor-Winfield Corporation, The. Welding machine auxiliary transfer clamp. 4,114,016, Cl. 219-97.000.

Tomecek, Jerry J. Antonomic transcutaneous affect device. 4,112,923, Cl. 128-1.300.

Tominaga, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha. Valve lifter for internal combustion engine. 4,112,884, Cl. 123-90.480.

Tomita, Chuji, to Hitachi Medical Corporation. X-ray apparatus. 4,114,039, Cl. 250-439.00R.

Tomy Kogyo Co., Inc.: *See—*
Sano, Hiroshi, 4,112,610, Cl. 46-12.000.

Toplak, Steve. Spinning toy. 4,112,613, Cl. 46-83.000.

Toppan Printing Co., Ltd.: *See—*
Matsunaga, Kazuo; Ishizawa, Hideo; and Kurata, Kenichi, 4,113,487, Cl. 96-38.100.

Torpie, John D.: *See—*
Heckman, Raymond F.; and Torpie, John D., 4,113,993, Cl. 179-90.00B.

Torr, Ralph Percival; and Beauchamp, Miles Albert, to Andre Rubber Company Limited. Spacing devices for overhead transmission lines. 4,113,979, Cl. 174-42.000.

Torralba, Jose Esteban, to Talleres Diesel, S.A. Hydraulic speed con-

trol systems for internal combustion engines. 4,112,902, Cl. 123-140.0FG.

Toshio, Iizuka: *See—*
Shogo, Iizuka; Mitsuo, Endo; Mitsugu, Watanabe; Toshio, Iizuka; and Kenji, Usui, 4,114,014, Cl. 219-56.000.

Toter-Tee, Inc.: *See—*
Glumac, Nick P., 4,113,118, Cl. 214-10.50R.

Totten, George Edward: *See—*
Williams, Thomas Charles; and Totten, George Edward, 4,113,696, Cl. 260-448.20B.

Toukan, Sameeh Said: *See—*
Hager, Robert Bonner; Toukan, Sameeh Said; and Walter, Gerald Joseph, 4,113,748, Cl. 260-348.430.

Towmotor Corporation: *See—*
Melocik, Grant C., 4,114,047, Cl. 307-9.000.

Townsend Engineering Company: *See—*
Townsend, Ray T., 4,112,881, Cl. 123-32.00B.

Townsend, Ray T., to Townsend Engineering Company. Rotary internal combustion engine employing compression ignition. 4,112,881, Cl. 123-32.00B.

Toyo Kohan Co., Ltd.: *See—*
Tsutsui, Nobuyuki; Inui, Tsuneo; and Kawamura, Hiroaki, 4,113,580, Cl. 204-37.00T.

Toyo Seikan Kaisha Ltd.: *See—*
Hotta, Hisashi; and Mori, Fumio, 4,113,539, Cl. 156-306.000.

Toyo Valve Company, Ltd.: *See—*
Okano, Masao, 4,113,474, Cl. 75-156.500.

Toyo Ysushinki Kabushiki Kaisha: *See—*
Hirata, Toshikiyo, 4,114,157, Cl. 343-119.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Arai, Hiroshi; and Mori, Mamoru, 4,113,280, Cl. 280-747.000.
Goto, Kenji; and Niwa, Takao, 4,112,877, Cl. 123-32.0ST.
Iwata, Toshiharu; Hattori, Tadashi; Mori, Kouichi; and Akiyama, Tomojiro, 4,112,885, Cl. 123-98.000.
Komiyama, Yoshiro; Kondo, Katsumi; Koyama, Mototsugu; Nagaoka, Masaaki; and Uchida, Tsuneo, 4,113,167, Cl. 228-176.000.
Miyagi, Hideo, 4,112,678, Cl. 60-276.000.
Nohira, Hidetaka, 4,112,894, Cl. 123-119.00A.
Okabayashi, Keiichi, 4,112,888, Cl. 123-117.00A.
Takimoto, Masatami; and Mizutani, Koichi, 4,112,898, Cl. 123-136.000.
Tominaga, Akira, 4,112,884, Cl. 123-90.480.

Tracy, David J.; and Hoffstadt, Walter F., to GAF Corporation. Process for the preparation of 3-anilino-5-pyrazolones. 4,113,954, Cl. 548-365.000.

Transco Products, Inc.: *See—*
Greiser, John W., 4,114,164, Cl. 343-895.000.

Trautner, Kersten: *See—*
Hugl, Herbert; Schundehutte, Karl Heinz; Trautner, Kersten; and Wolfrum, Gerhard, 4,113,428, Cl. 8-41.00R.

Travis, Brian A., to Datrix Corporation. Digital communication system for transmitting digital information between a central station and a number of remote stations. 4,114,141, Cl. 340-151.000.

Trebellas, John C.: *See—*
Rybny, Charles B.; Trebellas, John C.; and Sargent, Donald E., 4,113,592, Cl. 204-159.160.

Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, to Degremont. Method of measuring the mobility of colloids in an electrical field. 4,113,596, Cl. 204-180.00R.

Treplin, Friedrich-Wilhelm; and Borchert, Werner, to Ludwig Taprogge, Reinigungsanlagen fur Rohren-Warmeaustauscher. Apparatus for separating cleaning elements from a fluid. 4,113,008, Cl. 165-95.000.

Treuner, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. 7β-[(2-Amino-1,2-dioxoethyl)amino]acyl cephalosporins. 4,113,943, Cl. 544-26.000.

Trio Kabushiki Kaisha: *See—*
Sekiguchi, Tadao, 4,114,101, Cl. 325-455.000.

Tripp, Luther W. Direct-from-skein yarn feeder. 4,112,711, Cl. 66-1.00A.

Troope, Walter S.; and Lawrence, Jackson, to Cluett, Peabody & Co., Inc. Apparatus for compressively shrinking textile fabrics at high speed. 4,112,559, Cl. 26-18.600.

Trott, Donald E. Casing perforation method and apparatus. 4,113,016, Cl. 166-297.000.

Trotta, Robert. Method and apparatus for harnessing the power of moving water. 4,112,686, Cl. 60-639.000.

Troy, M. Frank, to Vapor Corporation. Mechanical stored energy positioning actuator. 4,113,06? Cl. 185-40.00R.

Trucks, Roger O.; and Steiner, Edwin C., to Dow Chemical Company, The. Process for preparation of (poly)cyclic polyethers. 4,113,739, Cl. 260-338.000.

TRW Inc.: *See—*
McKee, William H., 4,113,179, Cl. 339-91.00R.
McKee, William H., 4,113,337, Cl. 339-91.00R.

Tryciecky, Teodozij: *See—*
Shanker, Irvin Paul; and Tryciecky, Teodozij, 4,112,953, Cl. 128-419.00P.

Tsao, Utah, to Lummus Company, The. Hydrogen chloride recovery. 4,113,786, Cl. 260-659.00A.

Tsubamoto, Shinichi: *See—*
Tanaka, Shinzo; Tsubamoto, Shinichi; Yamashita, Koichi; Eguchi, Tadashi; and Inoue, Kashirou, 4,113,434, Cl. 23-232.00R.

Tsuchitani, Akira: *See—*
Okumura, Tomisaburo; Okazaki, Hiroshi; Tsuchitani, Akira; and Ueda, Seiji, 4,113,533, Cl. 148-187.000.

Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, to Sumitomo Chemical Company, Limited. Phosphorothiolate pesticidal composition. 4,113,864, Cl. 424-225.000.

Tsuji, Sadahiko; and Agari, Yujiro, to Canon Kabushiki Kaisha. Macro zoom lens. 4,113,355, Cl. 350-184.000.

Tsukamoto Seiki Co., Ltd.: *See—*
Miida, Eishiro, 4,113,290, Cl. 285-334.000.

Tsumori, Toshiro: *See—*
Tokumoto, Shin-Ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,113,581, Cl. 204-39.000.
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,113,582, Cl. 204-39.000.

Tsunekawa, Tokuichi; and Taguchi, Tetsuya, to Canon Kabushiki Kaisha. A leak current suppressing printed circuit board. 4,114,036, Cl. 250-214.00R.

Tsuruda, Kunihiro: *See—*
Maki, Masao; Kaneko, Yasunori; Tsuruda, Kunihiro; and Kobayashi, Ikuo, 4,113,839, Cl. 423-239.000.

Tsutsui, Nobuyuki; Inui, Tsuneo; and Kawamura, Hiroaki, to Toyo Kohan Co., Ltd. Steel sheet useful in forming foodstuff and beverage cans. 4,113,580, Cl. 204-37.00T.

Tsuzuki, Hidehiro: *See—*
Asari, Akira; and Tsuzuki, Hidehiro, 4,112,723, Cl. 72-60.000.

Tucker, Harold A., to B. F. Goodrich Company, The. Ethylenically unsaturated blocked aromatic diisocyanates. 4,113,958, Cl. 560-32.000.

Tucker, Hubert J. Method of preventing contamination of beverage containers. 4,112,650, Cl. 53-412.000.

Tugukuni, Hideyoshi; and Kano, Masafumi, to Dai Nippon Toryo Co., Ltd. Powdery coating composition and process for preparing the same. 4,113,917, Cl. 428-407.000.

Tuma, Frantisek: *See—*
Chrtek, Milan; Gabler, Josef; Tuma, Frantisek; Kasparek, Karel; and Blasko, Jan, 4,112,663, Cl. 57-58.890.

Turkall, Daniel N.: *See—*
Holman, Robert R.; and Turkall, Daniel N., 4,113,242, Cl. 277-1.000.

Turley, Richard J.; and Ozolins, Alexandre, to Olin Corporation. Method of bonding using an improved epoxy composition containing chlorine containing polyols. 4,113,541, Cl. 156-330.000.

Turner, Albert W. Lever assemblies for augmenting prime mover power. 4,113,047, Cl. 180-65.00D.

Turner, Philip L., to Systems, Science and Software. Method and apparatus for determining the volume of a condensed material sample. 4,112,738, Cl. 73-32.00R.

Turner, Robert B., to Johnson & Johnson. Automatic on/off digitally timed electronic switch. 4,112,764, Cl. 73-362.0AR.

Turner, Robert B., to Johnson & Johnson. Zero temperature coefficient reference circuit. 4,114,053, Cl. 307-310.000.

Turner, Robert Bruce; Menzin, Marvin; Robinson, Hugh A.; and Williams, Thomas S., to Johnson & Johnson. Probe cover grip and release device. 4,112,762, Cl. 73-343.00R.

Turtle Wax, Inc.: *See—*
Svedas, Stanley; and Shah, Champak C., 4,113,677, Cl. 260-23.00R.

Twilley, Ian Charles: *See—*
Russell, William Norman; Bruton, James Isaac; and Twilley, Ian Charles, 4,113,821, Cl. 264-210.00F.

Tylka, Etler-Peter. Spark plug with combustion pressure switches. 4,114,068, Cl. 315-51.000.

Uchida, Kuniki; Araki, Kenzi; Narita, Hirosi; Fukunaka, Shiro; and Kurihara, Takao, to Nippon Kokan Kabushiki Kaisha. Process of making high tension cold-reduced Al-killed steel excellent in accelerated aging property. 4,113,523, Cl. 148-12.300.

Uchida, Tsuneo: *See—*
Komiyama, Yoshiro; Kondo, Katsumi; Koyama, Mototsugu; Nagaoka, Masaaki; and Uchida, Tsuneo, 4,113,167, Cl. 228-176.000.

Uchida, Yoshiro: *See—*
Akado, Hajime; Uchida, Yoshiro; Yamaguchi, Akihide; Nonoyama, Takao; Ootsubo, Suminobu; and Harada, Toshiro, 4,112,896, Cl. 123-122.00D.

Uchidoi, Masanori: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Shimizu, Masami; Yoshikawa, Ryoichi; and Aizawa, Hiroshi, 4,114,173, Cl. 354-238.000.

Ueda, Seiji: *See—*
Okumura, Tomisaburo; Okazaki, Hiroshi; Tsuchitani, Akira; and Ueda, Seiji, 4,113,533, Cl. 148-187.000.

Uehara, Yasuhiro: *See—*
Nishide, Hiroo; and Uehara, Yasuhiro, 4,114,021, Cl. 219-216.000.

Uenishi, Akio: *See—*
Seo, Mamoru; and Uenishi, Akio, 4,114,054, Cl. 307-311.000.

Ueno, Eijiro, to Ueno Kohgyo Limited. Air-borne transportation system conveying truck. 4,113,202, Cl. 243-33.000.

Ueno Kohgyo Limited: *See—*
Ueno, Eijiro, 4,113,202, Cl. 243-33.000.

Uerdingen, Walter: *See—*
Bock, Manfred; Pedain, Josef; and Uerdingen, Walter, 4,113,705, Cl. 260-859.00R.

Ugelstad, John, to Sintef. Process for preparing latex. 4,113,687, Cl. 260-29.6XA.

Uhtenwoldt, Herbert R.; and Humes, Norman S., to Cincinnati Milacron-Heald Corp. Grinding machine. 4,112,624, Cl. 51-5.00D.
Uke, Alan K. Quick adjust strap for diver's face mask. 4,112,521, Cl. 2-452.000.
Uke, Alan Kurt. Diver's flashlight. 4,114,187, Cl. 362-158.000.
Uni-Cardan AG: *See—*
Krude, Werner, 4,112,709, Cl. 64-21.000.
Unimax Switch Limited: *See—*
Corfield, John Courtney, 4,114,001, Cl. 200-50.00A.
Union Carbide Corporation: *See—*
Atwood, Gilbert Richard, 4,113,849, Cl. 423-574.00R.
Kendall, John Edward; and Butwell, Kenneth Francis, 4,113,837, Cl. 423-226.000.
Litteral, Carl J., 4,113,845, Cl. 423-342.000.
Ward, Robert James, 4,113,691, Cl. 260-37.0EP.
Williams, Thomas Charles; and Totten, George Edward, 4,113,696, Cl. 260-448.20B.
Union Chimique Continentale-U.C.C.: *See—*
Simon, Pierre, 4,113,742, Cl. 260-343.500.
Union Oil Company of California: *See—*
Bernard, George G.; and Holm, LeRoy W., 4,113,011, Cl. 166-273.000.
Mickelson, Grant A., 4,113,605, Cl. 208-216.000.
United Kingdom Atomic Energy Authority: *See—*
McKnight, James Alan, 4,112,735, Cl. 73-19.000.
Williams, Raymond, 4,113,092, Cl. 206-408.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Coates, David; Gray, George William; and McDonnell, Damien Gerard, 4,113,647, Cl. 252-299.000.
Pierce, Donald, 4,113,210, Cl. 244-219.000.
Shaw, Harry, 4,113,205, Cl. 244-20.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
Hayward, Alan Thomas Joseph, 4,112,757, Cl. 73-207.000.
United States Bedding Company, The: *See—*
Golembeck, Gerald A.; and Horwitz, Thomas L., 4,112,529, Cl. 5-354.000.
U.S. Industries, Inc.: *See—*
Van Huis, Robert L., 4,112,872, Cl. 119-22.000.
United States of America
Agriculture: *See—*
Masri, Merle S.; Randall, Virginia G.; and Stanley, William L., 4,113,567, Cl. 195-63.000.
Air Force: *See—*
Mazdiyasni, Khodabakhsh S.; and Cooke, Charles M., 4,113,830, Cl. 264-101.000.
Army: *See—*
Borowick, John Joseph, 4,114,163, Cl. 343-815.000.
Goldsborough, Robert R.; Spencer, David R.; and West, Samuel F., 4,114,156, Cl. 343-112.00S.
Nossen, Edward J., 4,114,110, Cl. 331-2.000.
Energy: *See—*
Garin, John; and Belsick, James C., 4,113,564, Cl. 176-87.000.
Hale, Robert L., 4,112,568, Cl. 29-157.00C.
Jones, Robert D., 4,113,562, Cl. 176-40.000.
Health, Education and Welfare: *See—*
Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., 4,112,952, Cl. 128-418.000.
Interior: *See—*
Savanick, George A.; and Krawza, Walter G., 4,113,314, Cl. 299-4.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Laumann, Eugene A.; and Reynolds, Rollin K. Hydrogen-fueled engine. 4,112,875, Cl. 123-1.00A.
Navy: *See—*
Benham, Harold L.; Clark, Steven D.; Huffman, Hubert L.; and Stovall, Ronald J., 4,114,083, Cl. 320-39.000.
D'Albora, John M., 4,114,136, Cl. 340-3.00R.
Davis, Robert H., 4,114,189, Cl. 364-718.000.
Funk, Clarence J., 4,114,135, Cl. 340-2.000.
Gustafson, Paul R., 4,113,646, Cl. 252-184.000.
Hudson, George Elbert, III; and Clark, Arthur E., 4,112,699, Cl. 62-3.000.
Mason, Russell I.; and Dale, John R., 4,114,137, Cl. 340-85.000.
Savitt, Jacob, 4,112,845, Cl. 102-27.00R.
U.S. Philips Corporation: *See—*
deBrebisson, Michel, 4,113,513, Cl. 148-1.500.
Gansfried, Myles Stephen, 4,114,043, Cl. 250-445.00T.
Holland, Johannes; and Wagemans, Hubertus Franciscus Marie, 4,112,768, Cl. 73-422.00R.
Kooi, Else; and vanLierop, Joseph Gijsbertus, 4,113,515, Cl. 148-1.500.
Salles, Yvon; Leger, Pierre; and David, Gerard Andre, 4,113,543, Cl. 156-345.000.
Van Esdonk, Johannes, 4,112,563, Cl. 29-25.140.
United States Pipe and Foundry Company: *See—*
Kennedy, Harold, Jr., 4,113,286, Cl. 285-61.000.
United States Steel Corporation: *See—*
Steiner, John E., 4,113,132, Cl. 220-71.000.
United Technologies Corporation: *See—*
Bell, Mace, 4,113,980, Cl. 174-52.00R.
Huly, William; and Brouillette, Rudolph G., 4,112,862, Cl. 114-221.00R.
Reeder, Thomas M., 4,114,116, Cl. 333-30.00R.
Unitek Corporation: *See—*
Donner, Joseph E., 4,114,024, Cl. 219-489.000.
Universite de Sherbrooke: *See—*
Chornet, Esteban; and Cavalier, Jean-Claude, 4,113,651, Cl. 252-422.000.
University of California, The Regents of the: *See—*
Gram, Donald J., 4,113,959, Cl. 560-38.000.
Schrauzer, Gerhard N.; and Guth, Ted D., 4,113,590, Cl. 204-157.10R.
University of Utah: *See—*
Virkar, Anil V.; Miller, Mark L.; Cutler, Ivan B.; and Gordon, Ronald S., 4,113,928, Cl. 429-193.000.
Uno, Eiichi; and Hachiga, Takasi, to Nippondenso Co., Ltd. Electromagnetic type contactless ignition apparatus for internal combustion engine. 4,112,904, Cl. 123-148.00E.
UOP Inc.: *See—*
Carlson, David H. J., 4,113,604, Cl. 208-206.000.
Michalko, Edward, 4,113,659, Cl. 252-455.00Z.
Ward, Dennis J., 4,113,787, Cl. 260-669.00R.
Upjohn Company, The: *See—*
DeBoer, Clarence; Dolak, Lester A.; and Peterson, Durey H., 4,113,855, Cl. 424-117.000.
Hall, Charles M.; and Wright, John B., 4,113,880, Cl. 424-309.000.
Lednicer, Daniel, 4,113,866, Cl. 424-248.560.
Moon, Malcolm W.; and Kornis, Gabriel, 4,113,955, Cl. 548-374.000.
Moon, Malcolm W.; and Kornis, Gabriel, 4,113,956, Cl. 548-374.000.
Nelson, Norman A., 4,113,778, Cl. 260-590.00C.
Smith, Herman W., 4,113,961, Cl. 560-53.000.
Smith, Herman W., 4,113,962, Cl. 560-53.000.
Smith, Herman W., 4,113,963, Cl. 560-53.000.
Smith, Herman W., 4,113,964, Cl. 560-55.000.
Smith, Herman W., 4,113,965, Cl. 560-61.000.
Smith, Herman W., 4,113,966, Cl. 560-61.000.
USM Corporation: *See—*
Smith, George William, 4,113,186, Cl. 241-24.000.
Utsunomiya, Yutaka: *See—*
Takase, Hirobumi; and Utsunomiya, Yutaka, 4,112,721, Cl. 72-12.000.
Uyeda, Tim M., to Gartner, Klaus W. Padlock. 4,112,715, Cl. 70-38.00A.
Uzuka, Mitsuo, to Sony Corporation. Brushless motor driving circuit. 4,114,073, Cl. 318-138.000.
Vadetec Corporation: *See—*
Kemper, Yves Jean; and Bigot, Lucien, 4,112,779, Cl. 74-191.000.
Kemper, Yves Jean; and Bigot, Lucien, 4,112,780, Cl. 74-191.000.
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Vagyoczky, Stephen: *See—*
Kooi, J. Peter E.; and Vagyoczky, Stephen, 4,112,584, Cl. 33-292.000.
Vahrenkamp, Oscar Oswald. Pneumatic lift for single axle trailer. 4,113,274, Cl. 280-475.000.
Vaill, Ronald E., to Westinghouse Electric Corp. Manual control handle for electric vehicle. 4,113,042, Cl. 180-19.00H.
Vajna, Eugenio: *See—*
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, 4,113,694, Cl. 260-875.000.
Valley Hydro-Luft, Inc.: *See—*
Brown, Robert M.; and Karliner, Rudolf R., 4,113,151, Cl. 222-324.000.
Valmet Oy: *See—*
Kankaanpaa, Matti, 4,113,556, Cl. 162-272.000.
Kankaanpaa, Matti, 4,113,557, Cl. 162-301.000.
Sailas, Vaino, 4,112,565, Cl. 29-148.40D.
Van der Molen Machinefabriek B.V.: *See—*
Daenen, Bernardus, 4,112,799, Cl. 83-409.000.
Van Dorn Company: *See—*
Dietz, Raymond A. F.; Fundom, Danny L.; Henning, George J.; and McKinney, Lynn B., 4,113,095, Cl. 206-508.000.
Van Bavel, Adrianus W. M.: *See—*
Extra, Piet M. J.; Smeets, Lambertus R. J. M.; Van Bavel, Adrianus W. M.; Van Lieshout, Jacobus J.; and Deckers, Albert T., 4,112,870, Cl. 118-657.000.
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Vandensavel, Jean Marie: *See—*
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van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, to C. van der Lely N.V. Soil cultivating implements. 4,113,024, Cl. 172-59.000.
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, to C. van der Lely N.V. Soil cultivating implements. 4,113,026, Cl. 172-59.000.
van der Lely, Cornelis. Soil cultivating implements. 4,113,025, Cl. 172-59.000.
van der Lely, Cornelis. Soil cultivating implements. 4,113,027, Cl. 172-70.000.
Vander Meulen, Douglas J., to C. L. Frost & Son, Inc. Wheel bearing assembly with plastic bearing seals. 4,113,328, Cl. 308-187.100.

Van Esdonk, Johannes, to U.S. Philips Corporation. Color display tube and method of manufacturing same. 4,112,563, Cl. 29-25.140.

Van Huis, Robert L., to U.S. Industries, Inc. Poultry cage system with poultry removal. 4,112,872, Cl. 119-22.000.

vanLierop, Joseph Gijsbertus: *See—*
Kooi, Else; and vanLierop, Joseph Gijsbertus, 4,113,515, Cl. 148-1.500.

Van Lieshout, Jacobus J.: *See—*
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Van Ordstrand, Cayrl W.: *See—*
Gilbert, Henry L.; and Van Ordstrand, Cayrl W., 4,112,846, Cl. 102-52.000.

Van Ornum, Joel V.; and Stang, Peter L., to Rocket Research Corp. Elastomeric sealant composition. 4,113,799, Cl. 260-876.00B.

Van Rens, Russell J.: *See—*
Hackbarth, Eugene R.; and Van Rens, Russell J., 4,113,808, Cl. 261-52.000.

Van Zandt, Robert D. Animal climbing structure kit. 4,112,873, Cl. 119-29.000.

Vapor Corporation: *See—*
Troy, M. Frank, 4,113,063, Cl. 185-40.00R.

Varian Mat GmbH: *See—*
Lerche, Heinz, 4,114,050, Cl. 307-229.000.

Varma, Ravi K.; and Cimarusti, Christopher M., to E. R. Squibb & Sons, Inc. Steroidal[16α,17-b]benzodioxins. 4,113,722, Cl. 260-239.55R.

Vasilenko, Valentin Vasilievich: *See—*
Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich, 4,113,019, Cl. 169-12.000.

Vasiliev, Vladimir Sergeevich; Annenberg, Ernest Alexandrovich; Livshits, Abram Lazarevich; Polotsky, Vadim Evgenievich; and Lakhtjukhov, Valery Mikhailovich. Electric discharge machine with a program copier and a tool support head carried by a longitudinally and transversely driven carriage. 4,114,015, Cl. 219-69.00W.

Veba-Chemie Aktiengesellschaft: *See—*
Kurandt, Hans-Friedrich; and Schliephake, Dietrich, 4,113,835, Cl. 423-170.000.

Vecsey, Louis R.: *See—*
Wattles, Gurdon B.; and Vecsey, Louis R., 4,113,191, Cl. 241-188.00A.

Velsicol Chemical Company: *See—*
Stach, Leonard J.; Hotz, Roger D.; and Richter, Sidney B., 4,113,464, Cl. 71-88.000.

Venable, Phillip G., to J. I. Case Company. Power shift mechanism for earth working implements. 4,113,031, Cl. 172-667.000.

Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Biricz, Stefan, 4,113,003, Cl. 164-446.000.

Verhaeghe, Michael: *See—*
Balinte, Joe; and Verhaeghe, Michael, 4,113,022, Cl. 171-61.000.

Verini, Anthony J. Mount assembly for antennas with male-female securing means. 4,114,158, Cl. 343-715.000.

Verini, Anthony J. Dual pivot mount assembly for an automobile antenna. 4,114,159, Cl. 343-715.000.

Verini, Anthony J. Automobile antenna mounting bracket apparatus. 4,114,160, Cl. 343-715.000.

Vermillion, Henry J., Jr.: *See—*
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., 4,113,920, Cl. 428-565.000.

Versapak International Limited: *See—*
Anderson, Michael Denny, 4,112,990, Cl. 150-3.000.

Veyo, Stephen E.: *See—*
Sisk, Francis J.; and Veyo, Stephen E., 4,112,705, Cl. 62-238.000.

Vickers-Intertek Limited: *See—*
Ball, Kenneth, 4,113,085, Cl. 277-9.000.

Victor Company of Japan, Limited: *See—*
Kayanuma, Kanji, 4,114,180, Cl. 358-128.000.

Victor Stanley, Inc.: *See—*
Skalka, Gerald P., 4,113,312, Cl. 297-454.000.

Vierkant, Mark A.: *See—*
Anderson, Leroy E.; Charlson, David V.; and Vierkant, Mark A., 4,112,731, Cl. 72-320.000.

Virkar, Anil V.; Miller, Mark L.; Cutler, Ivan B.; and Gordon, Ronald S., to University of Utah. Method of preparing dense, high strength, and electrically conductive ceramics containing β''-alumina. 4,113,928, Cl. 429-193.000.

Visconti, Matteo, to Soxil S.p.A. Evaporating mixer for volatile anaesthetics. 4,112,939, Cl. 128-186.000.

Vishnevsky, Leonid Denisovich: *See—*
Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich, 4,113,019, Cl. 169-12.000.

Vita, Anthony J.: *See—*
Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., 4,112,952, Cl. 128-418.000.

Vivitar Corporation: *See—*
Altman, Richard M., 4,114,171, Cl. 354-152.000.

Vockenhuber, Karl: *See—*
Freudenschuss, Otto, 4,113,382, Cl. 356-5.000.

Vogel, Gerald James: *See—*
Kramer, Franklin; Henig, Yair Steve; Garin, Torunn Atteraas; and Vogel, Gerald James, 4,113,887, Cl. 426-422.000.

Vogt, Wilhelm: *See—*
aus der Funten, Helmut; and Vogt, Wilhelm, 4,113,741, Cl. 260-343.30R.

Volk, Heinrich: *See—*
Papenfuhs, Theodor; and Volk, Heinrich, 4,113,759, Cl. 260-439.00R.

Volkswagenwerk Aktiengesellschaft: *See—*
Beier, Alfred, 4,112,783, Cl. 74-470.000.
Heitland, Herbert; and Renger, Udo, 4,112,878, Cl. 123-32.0ST.
Muller, Hans; and Hanke, Georg, 4,113,071, Cl. 188-282.000.

Vollkommer, Norbert: *See—*
Blumenfeld, Georg; and Vollkommer, Norbert, 4,113,703, Cl. 528-299.000.

Volpe, Giancarlo: *See—*
Cavalleri, Bruno; and Volpe, Giancarlo, 4,113,953, Cl. 548-339.000.

Von Allmen, Martin; and Schwob, Hans Peter, to Lasag AG. Method for ablating metal workpieces with laser radiation. 4,114,018, Cl. 219-121.0LM.

von Bergmann, Hubertus Michael: *See—*
Hasson, Victor Haim; and von Bergmann, Hubertus Michael, 4,114,113, Cl. 331-94.50G.

von Linde, Joachim: *See—*
von Linde, Robert; von Linde, Joachim; and Kurz, German, 4,113,425, Cl. 431-352.000.

von Linde, Robert; von Linde, Joachim; and Kurz, German, to Caloric Gesellschaft Fuer Apparatebau m.b.H. Burner for fluid fuels. 4,113,425, Cl. 431-352.000.

von Loeben, Wolf: *See—*
Kiefer, Udo; von Loeben, Wolf; and Schulz, Friedrich Wilhelm, 4,113,393, Cl. 356-155.000.

von Wimmersperg, Heinrich F. Convertible child restraint. 4,113,306, Cl. 297-216.000.

Vredenburgh, Walter A.: *See—*
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., 4,113,801, Cl. 260-876.00B.

Vyzkumny ustav bavlnarsky: *See—*
Chrtek, Milan; Gabler, Josef; Tuma, Frantisek; Kasparek, Karel; and Blasko, Jan, 4,112,663, Cl. 57-58.890.

W. R. Grace & Co.: *See—*
Berry, Lawrence James; and Hall, Stanley Darwin, 4,113,139, Cl. 221-1.000.

W. Schlafhorst & Co.: *See—*
Raasch, Hans; and Muller, Lothar, 4,113,193, Cl. 242-18.00R.

W. Vinten Limited: *See—*
Stapleton, Harold Reginald, 4,113,215, Cl. 248-183.000.

WABCO Westinghouse GmbH: *See—*
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, 4,113,322, Cl. 303-105.000.

Wacker-Chemie GmbH: *See—*
Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, 4,113,760, Cl. 260-448.20E.

Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, 4,113,532, Cl. 148-174.000.

Wada, Hajime: *See—*
Deguchi, Hidetaka; Kikuchi, Shoji; Wada, Hajime; Satoh, Shui; and Endo, Takaya, 4,113,491, Cl. 96-66.00R.

Wada, Masao: *See—*
Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, 4,113,873, Cl. 424-274.000.

Waddill, Harold G.: *See—*
Schulze, Heinz; and Waddill, Harold G., 4,113,697, Cl. 528-94.000.

Wade, Elman E., to Westinghouse Electric Corp. Nuclear fuel handling grapple carriage with self-lubricating bearing. 4,113,558, Cl. 176-30.000.

Wagemans, Hubertus Franciscus Marie: *See—*
Holland, Johannes; and Wagemans, Hubertus Franciscus Marie, 4,112,768, Cl. 73-422.00R.

Waghorne, Winfield Earle: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 4,113,848, Cl. 423-512.00A.

Wagner, Hans: *See—*
Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, 4,113,773, Cl. 260-545.00R.

Wagner, Romeo Barrick, to Hercules Incorporated. Promotion of plant growth with compositions containing a dithiocarbamic acid derivative. 4,113,462, Cl. 71-7.000.

Wagner, Wayne M.; and Campbell, John A., to Donaldson Company, Inc. Exhaust system and muffler lap joint. 4,113,289, Cl. 285-322.000.

Wald Manufacturing Company, Inc.: *See—*
Pawsat, Carlton P.; and Humlong, Robert F., 4,113,395, Cl. 403-22.000.

Waldmann, Helmut: *See—*
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,113,747, Cl. 260-348.250.

Walker, Frank H., to General Motors Corporation. Centrifugal lock-up clutch and torque converter. 4,113,075, Cl. 192-3.310.

Walker, Harold G. Two-way scraper for ground tillage discs. 4,113,030, Cl. 172-566.000.

Wall, Robert G., to Chevron Research Company. Catalyst for ester hydrogenation. 4,113,662, Cl. 252-473.000.

Wallbergs Fabriks AB: *See—*
Svensson, Einar Gustav-Vilhelm, 4,112,570, Cl. 29-241.000.

Walley, Richard J. Automatic portable solid state voltage regulator tester. 4,112,748, Cl. 73-118.000.

Walski, Stanley, to Con-Spec Devices Inc. Apparatus to adjust and maintain the distance between wall forms. 4,113,226, Cl. 249-216.000.

Walter, Gerald Joseph: *See—*
Hager, Robert Bonner; Toukan, Sameeh Said; and Walter, Gerald Joseph, 4,113,748, Cl. 260-348.430.

Walter, Henry J., to Clairol, Inc. Ultrasonic cleaner. 4,114,194, Cl. 366-111.000.

Walter, Karl, to Agfa-Gevaert AG. Feeding and electrostatic holding originals in a copying machine. 4,113,380, Cl. 355-75.000.

Wambach, Allen Dale, to General Electric Company. Reinforced thermoplastic compositions of polyester resins and a polycarbonate resin. 4,113,692, Cl. 260-40.00R.

Wang, Long Shyong: *See—*
Ruckel, Erwin Richard; and Wang, Long Shyong, 4,113,653, Cl. 252-429.00B.

Wanner, Karl; and Reibetanz, Wilbert, to Robert Bosch GmbH. Rock drill. 4,113,037, Cl. 175-207.000.

Ward, Barry S.: *See—*
Helixon, Michael L.; and Ward, Barry S., 4,112,945, Cl. 128-218.00D.

Ward, Dennis J., to UOP Inc. Aromatic hydrocarbon dehydrogenation process. 4,113,787, Cl. 260-669.00R.

Ward, Robert James, to Union Carbide Corporation. Polymeric organosilicon compounds. 4,113,691, Cl. 260-37.0EP.

Wardwell, Charles H.; and Holcomb, Norman L., to Research Engineering & Manufacturing, Inc. Heat-treated article. 4,112,812, Cl. 85-46.000.

Wareham, Richard R.: *See—*
Driscoll, John J.; and Wareham, Richard R., 4,114,166, Cl. 354-76.000.

Warman International Limited: *See—*
Grzina, Anthony, 4,113,407, Cl. 415-170.00R.

Warner, Dale A.: *See—*
Schuman, Paul D.; Tarrant, Paul; Warner, Dale A.; and Westmoreland, Geraldine, 4,113,949, Cl. 544-303.000.

Wasai, Hiromi: *See—*
Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, 4,114,097, Cl. 325-320.000.

Washington State University Research Foundation: *See—*
Talbott, John W.; and Logan, James D., 4,113,812, Cl. 264-24.000.

Wasness, Donald S.: *See—*
Thrower, Herbert T., Jr.; and Wasness, Donald S., 4,114,071, Cl. 315-226.000.

Watanabe, Haruo; and Negishi, Masaaki, to Showa Sangyo Kabushiki Kaisha. Method for refining of palm oils. 4,113,752, Cl. 260-424.000.

Watanabe, Haruo: *See—*
Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, 4,113,416, Cl. 431-1.000.

Watanabe, Kazuo; Endo, Toshio; and Kojima, Katsuhiro, to Daido Tokushuko Kabushiki Kaisha. Automatic deseaming apparatus for elongate block of metallic material. 4,112,626, Cl. 51-35.000.

Watanabe, Kazuo: *See—*
Kakinuma, Toshihide; Kume, Toshiaki; Takenoya, Hideaki; Makabe, Hachiro; and Watanabe, Kazuo, 4,112,858, Cl. 112-158.00E.

Watanabe, Masanori: *See—*
Onda, Eiichi; Watanabe, Masanori; Nakagawa, Tadashi; Nemoto, Ichiro; and Koyama, Mitsuo, 4,114,174, Cl. 354-249.000.

Watanabe, Morio; and Nishimura, Sanji, to Solex Research Corporation of Japan. Process for recovery of waste H_2SO_4 and HCl. 4,113,588, Cl. 204-151.000.

Watson, Albert T.; and Hull, Robert L., to Exxon Research & Engineering Co. Polypropylene impact blends having improved optical properties. 4,113,806, Cl. 260-897.00A.

Watt, William R.; Astolfi, Edmund G.; and Laufer, Jay K., to American Can Company. Method for producing multilayered coated substrate. 4,113,895, Cl. 427-44.000.

Wattles, Gurdon B.; and Vecsey, Louis R., to Entoleter, Inc. Laminated rotor processing apparatus. 4,113,191, Cl. 241-188.00A.

Wavin B.V.: *See—*
de Putter, Warner Jan, 4,112,795, Cl. 83-15.000.

Wear-Cote International, Inc.: *See—*
Henry, Russell Alger; and Summers, Ernest Moreland, 4,113,899, Cl. 427-250.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
Leiter, Robert, 4,113,304, Cl. 296-137.00G.

Webb, Allen N.: *See—*
Herbstman, Sheldon; Webb, Allen N.; and Estes, John H., 4,113,657, Cl. 252-442.000.

Webb, Michael Guthrie, to British Petroleum Company Limited, The. Oil boom. 4,112,689, Cl. 405-63.000.

Webb, Robert: *See—*
Show, Roger; and Webb, Robert, 4,113,834, Cl. 423-155.000.

Weber, Helmut: *See—*
Jutte, Hans; and Weber, Helmut, 4,112,696, Cl. 405-145.000.

Wedemeyer, Karlfried: *See—*
Fiege, Helmut; Haydn, Josef; Renner, Johann; and Wedemeyer, Karlfried, 4,113,975, Cl. 568-756.000.

Weed Eater, Inc.: *See—*
Ballas, George C.; and Mitchell, Albert W., 4,112,653, Cl. 56-12.700.

Wehinger, Egbert: *See—*
Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,113,872, Cl. 424-273.00P.
Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,113,957, Cl. 548-377.000.

Wehner, Norvin J., deceased (by Wehner, Virginia L., surviving spouse), to Cramer Industries, Inc. Locking device. 4,113,221, Cl. 248-408.000.

Wehner, Virginia L., surviving spouse: *See—*
Wehner, Norvin J., deceased, 4,113,221, Cl. 248-408.000.

Weiberg, Otto: *See—*
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,113,747, Cl. 260-348.250.

Weigert, Wilhelm: *See—*
Olbrich, Gottfried; and Weigert, Wilhelm, 4,112,978, Cl. 138-30.000.

Weird Products Ltd.: *See—*
Huston, Henry H., 4,113,253, Cl. 273-96.00R.

Weiss, Martin Joseph, to American Cyanamid Company. 15,16-Dioxy prostenoic acids and esters. 4,113,967, Cl. 560-121.000.

Weiss, Warren I.: *See—*
Rosenthal, Isadore; Exner, Lawrence J.; Niksa, Gregory J.; Weiss, Warren I.; and Young, Maurice G., 4,112,714, Cl. 68-206.000.

Weitzel, Hans: *See—*
Bischoff, Jurgen; Kowitz, Friedrich; Ott, Karl-Heinz; Schuster, Herbert; Rohr, Harry; and Weitzel, Hans, 4,113,796, Cl. 260-876.00R.

Weitzner, Jonas. Slide fastener bottom ends. 4,112,553, Cl. 24-205.11R.

Wellman, James H. Gas pump nozzle. 4,113,153, Cl. 222-571.000.

Wells, John B., to Xerox Corporation. Migration imaging method involving color change. 4,113,482, Cl. 96-1.0PS.

Wells, Tom J.: *See—*
Adams, Elvin E.; Wells, Tom J.; Wentzek, Horst F.; Zapletal, Henry; and Zugel, Marty J., 4,112,726, Cl. 72-137.000.

Wenrick, Brian A., to Protective Treatments, Inc. Longitudinally curved impact resistant trim strips. 4,113,295, Cl. 293-71.00R.

Wentzek, Horst F.: *See—*
Adams, Elvin E.; Wells, Tom J.; Wentzek, Horst F.; Zapletal, Henry; and Zugel, Marty J., 4,112,726, Cl. 72-137.000.

Werba, William J.: *See—*
MacLennan, P. H. Barry; Ireland, Graham A.; and Werba, William J., 4,112,756, Cl. 73-181.000.

Werder, Roger Daniel; Meier, Linus; and Lang, Karl, to Mettler Instrumente AG. Automatic analysis apparatus. 4,113,436, Cl. 422-65.000.

Werlich, Harald Willy: *See—*
Pole, Robert Vladimir; and Werlich, Harald Willy, 4,113,343, Cl. 350-3.710.

Werner, Clements M. Fire extinguishant dispensing nozzles. 4,113,021, Cl. 169-37.000.

Werner, Dietmar: *See—*
Gettert, Hans; Jeck, Arnulf; and Werner, Dietmar, 4,113,445, Cl. 48-197.00R.

Werner, Paul; Wirtz, Egon; and Lehmann, Gerhard, to Keiper K. G. Tiltable seat. 4,113,308, Cl. 297-362.000.

Werst, Lyman L., to Parks-Cramer Company. Plural sensor ends down detecting apparatus. 4,112,665, Cl. 57-81.000.

Wessling, Ritchie A.: *See—*
Pickelman, Dale M., Sr.; and Wessling, Ritchie A., 4,113,710, Cl. 526-30.000.

West, Samuel F.: *See—*
Goldsborough, Robert R.; Spencer, David R.; and West, Samuel F., 4,114,156, Cl. 343-112.00S.

Western Electric Company: *See—*
Clement, George Frederick; and Sniegowski, Bruno Raymond, 4,113,986, Cl. 179-2.00A.

Western Electric Co., Inc.: *See—*
Tedeschi, Anthony, 4,114,006, Cl. 200-234.000.

Westfalia Separator Aktiengesellschaft: *See—*
Pautsch, Gunthard; and Kohlstette, Werner, 4,113,172, Cl. 233-11.000.

Westinghouse Air Brake Company: *See—*
Balukin, Richard F., 4,113,320, Cl. 303-54.000.
Zoric, Michael T., 4,113,319, Cl. 303-37.000.

Westinghouse Brake & Signal Co. Ltd.: *See—*
Paginton, Philip Norman, 4,113,070, Cl. 188-196.00F.

Westinghouse Electric Corp.: *See—*
Albaric, Jacques E., 4,114,058, Cl. 310-54.000.
Albaric, Jacques E.; Curtis, Little P.; and Dailey, George F., 4,114,059, Cl. 310-54.000.
Asars, Juris A., 4,114,070, Cl. 315-169.0TV.
Cameron, Frank L., 4,114,128, Cl. 337-162.000.

Csanady, Michael, Jr., 4,112,975, Cl. 137-625.290.
Csanady, Michael, Jr., 4,113,622, Cl. 210-167.000.
DeCorso, Serafino M., 4,112,676, Cl. 60-39.710.
Eley, Edgar R., 4,113,339, Cl. 339-111.000.
Fidler, Gary L.; Hill, Richard A.; and Carrera, John P., 4,113,561, Cl. 176-38.000.
Frink, Russell E.; and Milianowicz, Stanislaw A., 4,114,003, Cl. 200-144.00R.
Glaudel, Stephen P.; and Chambers, Norman T., 4,114,084, Cl. 322-38.000.
Gohm, William G., 4,113,611, Cl. 209-215.000.
Hull, Robert E.; and Gemp, Robert S., 4,114,048, Cl. 307-53.000.
Lee, Richard M.; and Szema, Li C., 4,113,406, Cl. 415-115.000.
Maier, Alfred E.; Armstrong, Donald D.; and Farley, James R., 4,114,005, Cl. 200-153.00G.
Nelkin, Arthur; Skinner, Dale D.; Wilson, Donald G.; and Palmer, Harold D., 4,114,063, Cl. 310-334.000.
Oates, Robert M.; and Mackenzie, Raymond W., 4,114,077, Cl. 318-473.000.
Petrie, Edward M., 4,113,684, Cl. 260-29.2EP.
Pillsbury, Paul W.; and DeCorso, Serafino M., 4,112,675, Cl. 60-39.060.
Smith, James D. B.; and Kauffman, Robert N., 4,113,791, Cl. 260-830.0TW.
Tobin, Joseph M., 4,113,563, Cl. 176-84.000.
Vaill, Ronald E., 4,113,042, Cl. 180-19.00H.
Wade, Elman E., 4,113,558, Cl. 176-30.000.

Westmoreland, Geraldine: *See—*
Schuman, Paul D.; Tarrant, Paul; Warner, Dale A.; and Westmoreland, Geraldine, 4,113,949, Cl. 544-303.000.

Weston, David, to Reynolds Metals Company. Concentration of hydrated aluminum oxide minerals by flotation. 4,113,466, Cl. 75-2.000.

Westvaco Corporation: *See—*
Forbes, Hampton E., Jr., 4,113,086, Cl. 206-45.140.

Westwood, William Dickson, to Northern Telecom Limited. Multiple lens system for an optical imaging device. 4,114,037, Cl. 250-216.000.

Wetzels, Walter, to SCHUMAG Schumacher Metallwerke Gesellschaft mit beschankter Haftung. Device for grinding elongated cylindrical workpieces. 4,112,625, Cl. 51-33.00W.

Wheeler, David C. Lighter-than-air apparatus and method of utilizing same. 4,113,206, Cl. 244-31.000.

Wheldon, Alfred G.; and Harris, Ernest D., to Distillers Company (Carbon Dioxide) Ltd., The. Gas detector. 4,112,736, Cl. 73-23.000.

Whirlpool Corporation: *See—*
Marcade, Roque Denis, 4,112,588, Cl. 34-45.000.

White Chemical Corporation: *See—*
Mischutin, Vladimir, 4,113,902, Cl. 427-390.00D.

White, James E.: *See—*
Schumacher, Ignatius; and White, James E., 4,113,574, Cl. 203-8.000.

White, James F.; and Applequist, Michael D., to Standard Oil Company, The. Preparation of acrylic or methacrylic acid from acrolein or methacrolein. 4,113,768, Cl. 562-535.000.

Whitehead, James Stephen: *See—*
Liberman, Harvey W.; and Whitehead, James Stephen, 4,112,823, Cl. 91-36.000.

Whiting Corporation: *See—*
Bella, Frank, Jr.; and Bennett, Richard C., 4,113,552, Cl. 159-27.00A.

Widdicombe, Derek Gordon, to Naylor Brothers (Clayware) Limited. End cap for pipes. 4,112,979, Cl. 138-89.000.

Wiedemann, Kurt; and Seiferth, Reinhard, to Siemens Aktiengesellschaft. Pulse radar apparatus with integration device. 4,114,152, Cl. 343-7.700.

Wiedenmann, Hans, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen m.b.H. Subminiature incandescent lamp. 4,114,066, Cl. 313-315.000.

Wiegand, Karl E.: *See—*
Lawrence, Walter W., Jr.; McKay, Tom W.; and Wiegand, Karl E., 4,113,771, Cl. 562-568.000.

Wiener, Hans, to C. A. Weidmuller KG. Cable-stripping tool. 4,112,791, Cl. 81-9.50A.

Wild, John Paul, to Commonwealth Scientific and Industrial Research Organization. Geodesic lens. 4,114,162, Cl. 343-754.000.

Wild, Robert W.; and Keeney, Joseph G., to C. H. Heist Corporation. High pressure jet wall cleaner apparatus. 4,112,535, Cl. 15-98.000.

Wilkinson Sword Limited: *See—*
Thompson, John; and Pitfield, Adrian, 4,113,643, Cl. 252-90.000.

Willbanks, Charles E., to Milliken Research Corporation. Method for sculpturing pile fabrics. 4,112,560, Cl. 28-160.000.

Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Auxiliary sewing machine support table for use with a sewing machine table. 4,112,859, Cl. 112-217.100.

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